TEACHING THE AUTHENTIC PERFORMANCE OF BRAZILIAN POPULAR MUSIC STYLES TO NON-NATIVE MUSICIANS: THE DEVELOPMENT OF A PEDAGOGICAL APPROACH

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

DOCTOR OF ARTS

BY

BRUNO MODOLO CABRERA

DISSERTATION ADVISOR: DR. DON P. ESTER

BALL STATE UNIVERSITY

MUNCIE, INDIANA

MAY 2018

ABSTRACT

DISSERTATION: Teaching the Authentic Performance of Brazilian Popular Music Styles to Non-Native Musicians: The Development of a Pedagogical Approach

STUDENT: Bruno Modolo Cabrera

DEGREE: Doctor of Arts

COLLEGE: Fine Arts

DATE: May 2018

PAGES: 129

The lack of stylistic authenticity in performances of Brazilian popular music by non-native musicians is a significant and often-cited issue among native Brazilians who live and perform outside the country. Based on research in the areas of music perception, music cognition, and psychomotor learning theories, a complete pedagogical approach was created that develops cultural background, context, pattern vocabulary, and technical skills and guides non-native musicians to authentic performances of Brazilian popular music styles such as samba, bossa nova, choro, baião, and maracatu. A brief survey of four Brazilian popular music experts obtained anecdotal results suggesting that student ensembles prepared using the pedagogical approach were perceived as relatively more authentic as compared to professional non-native ensembles. Future studies can provide more information about the approach's effectiveness and applications to cultural music styles from different countries around the world.

ACKNOWLEDGEMENTS

There are no words that can express my deepest gratitude to all the people who helped, encouraged, and supported me! First of all, I would like to thank all faculty members from Ball State University who contributed to my education and completion of this dissertation. Special thanks for my committee members who provided guidance and support during the examination process, the development of this research, and finally the defense. I appreciate all the insight and guidance received from Dr. Scott Routenberg and Dr. Allen Truell. Thanks are due to professor Braham Dembar, who was my percussion mentor during the past three years and helped me improve tremendously as a performer. Thank you to Dr. Robert Willey for the support with recordings and meetings related to this and other projects, his input and feedback were deeply appreciated. Thank you to Dr. Don P. Ester, my dissertation advisor, to whom I owe my greatest gratitude and appreciation. Without his unconditional help, support, and dedication this project would not have been possible. Dr. Ester was my Psychology of Music professor and it was during his class that the inspiration and work for this research started two years ago. Besides pushing me to the limit and getting the best out of me, he spent hours and hours providing guidance during meetings and even more hours helping revise and shape this document. I have tears in my eyes and no more words in my mouth to express how grateful I am for all his support and wisdom. Thank you Don!

I would like to thank many friends and colleagues who provided support and were patient during many stressful moments during this process. Thanks to all my friends from many different places in the US, other countries, and especially friends from Brazil, who

supported me from all the way over there. Thank you Leonardo Bertolini Labrada, Helvio Mendes, Nelton Essi, Paulo Dias, Herivelto Brandino, and professor Dinho Gebara for being always ready to help whenever I needed!

Lastly, I would like to thank my family that even from far supported me. Thanks to my little brother, Felipe Modolo Cabrera – miss you bro! Special thanks to my parents, José Geraldo Cabrera and Lucila Modolo Cabrera, who always supported and provided me with the best they could. They are excellent parents who, even though heart-broken, accepted my choice of moving so far away to pursue my dream. They have always been supportive. My mom is calling in this very moment as I write this; that was weird! Thanks to my fiancée, Marina Stojanovska, who I love very much and have treasured being by my side for many years already. She has been my wonderful companion and, even though she is going through a doctorate herself, found the time and strength to help, support, and be patient with me whenever I needed her by my side. I love you, babe!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The 20th century was a period of great development of popular and folk music in many different countries in the world. A great part of this development happened locally, but the awareness of these various popular and folk styles grew significantly when nationalist composers used them in their classical works. Cross-cultural germination was important as well. In the United States, for example, the development of jazz was influenced by Afro-Cuban and Brazilian styles, resulting in many collaborative works between artists – notably Dizzy Gillespie with Mario Bauzá, and Frank Sinatra with Tom Jobim. Currently, a variety of Afro-Cuban and Brazilian music styles are being taught in school settings and universities throughout the world. Teaching such styles can be a challenging task, especially to students who are not native to the specific culture from which each musical style emerges. Such students may find themselves struggling to learn foreign musical styles, mostly because the available method books focus on teaching patterns, while the cultural context and the subtleties of style are ignored or not approached with enough depth to develop an authentic performance. As a Brazilian popular music teacher living and teaching in the United States, I have had success instructing students by having them play a series of patterns related to each style and then apply this to concert literature. Without the cultural background and proper technical guidance, however, they were not developing the skills to fully understand how those patterns and musical elements synthesize to become a style. Proper inflections, feels, and approaches to basic patterns were often missing, resulting in performances that do not sound as authentic as when performed by native

Brazilian musicians who grew up in Brazil and were steeped in its music and culture. I personally witnessed a parallel experience studying jazz in Brazil: Most Brazilian students learning jazz have difficulty understanding its swing and the proper feel, regardless of their level of proficiency.

Certainly, there is no shortage of method books about Brazilian popular music styles in Portuguese and English. These resources are mostly percussion-related materials that provide excellent information and clear usage of all musical elements and patterns. It is also common to find resources for piano, guitar, and bass guitar – instruments that function as rhythmic/harmonic support in Brazilian popular music styles. In *Marco Pereira: Brazilian Guitar Virtuoso,* Swanson (2004) states that much of Pereira's education in Brazilian styles "came from the rhythmic examples in the book *Essential Styles: For the Drummer and Bassist (Book I)"* (p. 1). In *Brazilian Piano – Choro, Samba, and Bossa Nova* (Willey & Cardim, 2010), the authors include brief explanations about the Brazilian culture and basic musical feel, a significant variety of patterns for percussion instruments, and explanations of how those patterns are applied and transferred to the piano.

Brazilian popular music styles are strongly rooted in percussion and rhythmic patterns; therefore, the literature includes constant review and reinterpretation of patterns related to percussion and harmonic/rhythmic instruments such as piano, guitar, and bass guitar. In contrast, little is available for melodic instruments such as reeds and brass instruments, which play a major role in several contemporary manifestations of Brazilian popular music. As an ensemble director, I have difficulty directing students who play melodic instruments to resources that could help them enrich their performance skills related to Brazilian popular music. When I instruct native Brazilians, I need to provide little

or no guidance about how to perform a determined melodic line or accompaniment that works both as rhythmic and harmonic support. The same musical elements, however, often become a major challenge to non-native players who did not have any prior contact with such musical styles.

During my music studies in the United States, I have performed Brazilian popular music in many different settings and with both native and non-native Brazilians. Building on my experiences as a performer and as a music professor, I have experimented with a pedagogical approach designed to teach non-native Brazilians the background of each Brazilian popular style and an understanding of and technical ability to perform the correlated vocabulary of rhythmic patterns, leading them to the appropriate feel and authenticity for each of the styles. Authenticity is a major issue in Brazilian popular music styles and must be approached with the same level of importance as general technical skills; the simple fact that musicians can perform a series of patterns does not mean they are, in a certain manner of speaking, pronouncing it properly.

Purpose of the Project

The purpose of this project was to develop and present a pedagogical approach to teaching the authentic performance of Brazilian popular music styles to non-native musicians. The final dissertation provides a detailed explanation of the pedagogical approach, which includes teaching cultural background and context as well as pattern vocabulary and technical skills via the interweaving of two research-based learning sequences: The Virtual Learning Sequence and The Motor Learning Sequence. A supplemental part of this project sought initial validation of the pedagogical approach: A few Brazilian popular music experts were asked to compare recorded performances by

native-Brazilian musicians to performances by non-native musicians taught by the author using the pedagogical approach in an authentic ensemble setting. This was not a formal research study but rather an informal approach designed to obtain anecdotal evidence about the initial effectiveness of this approach in terms of authenticity.

Limitations of the Project

The supplemental component of this project was not intended as or designed to be a formal research study. The results served only as initial anecdotal evidence of the effectiveness of the pedagogical approach, providing direction for future refinement and research.

Definition of Terms

The following terms are defined as they were used for the purposes of this project:

- *Brazilian popular music styles*: Any genre of music performed by the Brazilian people as part of their cultural expression; among other musical styles, the most common are samba, bossa nova, choro, baião, forró and maracatu.
- *Non-native musicians*: Any musician who did not grow up in Brazil or was not raised by Brazilian parents who were embedded in cultural expressions of the Brazilian people.

Significance of the Project

The lack of stylistic authenticity in performances of Brazilian popular music by non-native musicians is a significant and often-cited issue. Several native Brazilian musicians with whom I have worked in the United States consistently make this observation. One example is Mr. Paulo Sauer Dias, with whom I have performed several times here in the United States. He has an extensive career as a Brazilian popular music pianist and has performed with important Brazilian artists such as Chico Buarque de Hollanda, Moraes Moreira, Djavan, Nana Caymmi, and Clara Nunes. After coming to the United States, Mr. Dias began performing with local musicians, including both native and non-native Brazilians. According to Mr. Dias, a large gap of authenticity exists between these two groups of musicians. This project benefits non-native Brazilian musicians who desire to develop an in-depth understanding of how to perform Brazilian popular music styles. The development of this pedagogical approach also benefits all music teachers, providing them with pedagogical strategies to reduce or eliminate the gap of stylistic authenticity between native and non-native performers of Brazilian popular music.

CHAPTER 2

REVIEW OF LITERATURE

The development of a pedagogical approach to teaching the authentic performance of Brazilian popular music styles to non-native musicians requires a thorough grounding in the roots of these styles as well as research and learning theory related to teaching authentic performance style. This literature review addresses the roots of Brazilian popular music styles, research related to performance authenticity, and the scholarship of pedagogy that impacts the development of authentic performances.

The Roots of Brazilian Popular Music Styles

A great diversity of Brazilian popular music styles exists across the country, and each region developed its own musical culture over the years. Styles such as samba, bossa nova, choro, baião, frevo, and maracatu became more popular than others being performed and taught around the globe. Among the vast cultural influences that affected the development of these styles, it is important to mention that they are heavily rooted in African drumming. The origins of samba, for example, "lay in rhythmic drumbeats that traditionally accompanied African religious ceremonies brought to Brazil by African slaves" (Raphael, 1990, p. 74). The original setting of maracatu involves a large percussion ensemble similar to a samba school *bateria* (percussion ensemble), including alfaias, ganzás, xequerês, tarois, gonguês, and other percussion instruments. Other styles like frevo, choro, and baião were influenced by Afro-Brazilian rhythms as well. The African roots are a common trait of all these styles, but each one includes unique rhythmic patterns that define it. As a result, the rhythm and the pattern inflections are the most important

elements to be developed during the teaching process. The influence of American jazz also played an important role in the development of some Brazilian styles such as bossa nova, especially in terms of performing ensembles. Some Brazilian popular music styles were stylized and played by ensembles similar to jazz combos in which the drummer functions as a synthesis of the percussion ensembles, playing several patterns at the same time to depict the large percussion groups and create authentic grooves.

Barsalini (2009) sought to demonstrate how the drum set performances of Brazilian music styles developed from the beginning of the 20th century until the 1960's. According to his research, drum set performances are constantly changing. The first appearance of *samba batucada* on the drum set was in the early 20th century with Luciano Perrone. A generation later, significant changes to *samba de prato* (samba on the cymbal) were made by Edison Machado. Both continue to be the most significant influences on Brazilian drum set playing. Based on bibliographical sources about Brazilian music history, culture, socio-political elements, and analyses of recordings and transcriptions, Barsalini concluded that drum set patterns can only represent a musical style if they are put into context. Therefore, establishing connections among the drum set approaches, historical and musical elements of different styles, and the development of each style throughout the 20th century is critical to understanding the musical culture and identity during those years.

Aquino (2014) investigated the historical development of the drum set. He concluded that the use of the drum set in Brazilian music started around 1917 and was consolidated by Luciano Perrone. Aquino sought to determine Luciano Perrone's importance in terms of mediating practices between drum set, popular percussion, and concert percussion, given that Perrone was active in all of these. He also wanted to

establish Perrone's importance to future generations by analyzing his performance characteristics and comparing them with latter practice characteristics. Based on extensive fieldwork and analyses of bibliographical materials and a large discography, Aquino concludes that the bossa nova period represents a gap with respect to drum set practices and the division between traditional and modern performances.

Smith (2014) provided a more in-depth and modern vision of the current drum set performance scene in Brazil. The purpose of his research was to analyze current practices through fieldwork and interviews with important and currently active Brazilian drummers such as Ramon Montagner, Eduardo Ribeiro, and Celso de Almeida. Smith concluded that performing samba on the drum set has become a continuing and growing interest for drummers around the world. Although many method books approach the subject, they seem to lack important elements of contemporary Brazilian drum set playing that most renowned professionals learned and developed through oral tradition and actual performances rather than in practice rooms.

The rhythmic patterns in Brazilian popular music styles are very important because they apply to harmonic and melodic instruments as well. The guitar, for example, is one of the most important instruments in Brazilian music, appearing in many settings of different styles. Lopes (2013) conducted a study investigating a playing approach known as "Brazilian guitar" – a term referring to a playing approach rather than a different instrument. Lopes' eventual goal was to develop a methodology to teach Brazilian guitar performance style. After analyzing a series of solos and accompaniments from recordings and interviewing professional guitar players and teachers, Lopes concluded that this performance approach is characterized by unique rhythm components. To teach it, the

methodology should be divided by styles, teaching a different musical style per semester: first choro, then Northeastern styles, and lastly samba.

Swanson (2004) investigated the development of Brazilian guitar. His study included focusing on how the instrument and the guitarist Marco Pereira are important for the Brazilian musical identity, delineating their history, and examining the history of performers who inspired Marco Pereira, such as Baden Powell, Paulinho Nogueira, and João Gilberto. Swanson determined how Marco Pereira developed his style and how he became an important figure of Brazilian music. He concluded that the guitar as an instrument helped to narrow social gaps over the years because it was present in many different settings of both popular and classical Brazilian music – in part because Marco Pereira himself was very influential in both scenes.

The style known as baião is originally from the Northeast region of Brazil, whereas samba, choro, and bossa nova are from the Southeast region of the country. While baião's original instrumentation includes accordion and percussion instruments like zabumba and triangle, over the years it became stylized and performed by big bands, jazz combos, and other ensembles. Ramalho (1998) researched the life and career of the composer Luiz Gonzaga, who is credited with popularizing the baião. Ramalho established the reasons for Gonzaga's popularity and, by analyzing compositions such as Gonzaga's most famous song "*Asa Branca,"* he connected the music with the cultural elements of the Northeast area of Brazil known as Sertão.

Witmer (2009) conducted a study about the role of the flute and flutists in the musical style known as choro. Influenced by Afro-Brazilian rhythms and characterized by rhythmic syncopations, choro also includes elements of classical music such as rondo form

and common usage of counterpoint and modulations. Witmer's purpose was to demonstrate that choro ensembles helped to establish the flute as the first instrument to require virtuosic performances in the style and that earlier composers helped transform choro into a sophisticated genre of music. Witmer analyzed influential choro composers such as Joaquim Antonio da Silva Callado, Pixinguinha, and Benedicto Lacerda. Following a thorough review of studies about choro style and interpretation, choro composers, and the role of flute in Brazilian music, Witmer concluded that choro remains one of the few popular music styles to emphasize instrumental virtuosity, with the flute typically the featured melodic instrument of the ensemble.

It is clear that Brazilian styles are very rooted in African drumming, making rhythm and rhythmic patterns the most important characteristic elements of each style. In order to develop an effective teaching pedagogy for such styles, it is necessary to understand their rhythmic patterns, as well as the rhythmic inflections and the different types of swing that characterize each style. Although the rhythmic roots are an important trait of the styles, this is not the only element needed for authenticity. To develop a teaching pedagogy that leads to authentic performances, it is important to consider all the elements that make each style authentic, including how native Brazilians learn how to perform their own music.

Performance Authenticity

Authenticity has become an important topic in music. Whether approaching Western music styles such as Medieval and Baroque or world music styles such as Salsa and Indian Raga, authenticity is one of the most significant challenges for music educators. The literature about authenticity in music features a wide variety of topics including the challenges of choosing appropriate repertoire. Knapp (2012) suggests one of the reasons

for this: “Because teachers are often asked to teach music from cultures with which they are unfamiliar, selecting classroom repertoire that accurately represents a culture can be challenging” (pp. 13-14). Another important topic is the importance of informal learning to the process of achieving authentic performances. “Many musicians use informal processes to learn music, especially popular or vernacular music genres” (Murray, 2013, p. 77). In choro style, for example, the informal learning plays an extensive role. “The roda de choro provides a unique social gathering in which musicians of all levels, beginner to professional, experience music together – simultaneously practicing, performing, and learning” (Murray, 2013, p. 22). Reinforcing Knapp, Murray describes another example: “Beyond reading music, Brazilian musicians use fixed-do solfege to discuss musical ideas. This system can be confusing to people unfamiliar with it, especially native English speakers” (p. 141)

This project focuses on the unique style traits of Brazilian popular music. The term *brasilidade* – most closely translated as “Brazilianness” – is best defined as the characteristics or particularities that define something or someone as Brazilian. The term is commonly used by native Brazilians to depict cultural characteristics such as the personality traits of Brazilian people or the style traits of Brazilian musical. In order to teach authentic performance of Brazilian popular music styles, it is necessary to understand how native Brazilians learn their own music and apply elements of that process into the pedagogy. It is also important to understand correlations between the music and the cultural function of each style.

Murray (2013) investigated the history of choro schools: institutions focused on transmitting and sustaining current practices of the choro style. The author investigated

pedagogical practices and processes from different time periods, interviewed and surveyed both performers and teachers, and observed the "rodas de choro" (choro circles) and the teaching in the schools. He concluded that the authentic choro performer learns the craft through experience, performing with others, private practice, memorization of repertoire, and performing by ear. A great part of the learning process also happens through socializing with the choro community, as well as through writing transcriptions of recordings.

Brunet (2012) conducted investigations about gender roles in samba schools in the city of São Paulo. This may be considered a delicate topic, but its investigation is essential to understand how the music is deeply influenced by the culture. Brunet sought to understand how certain roles came to be labeled as masculine or feminine, how they are highlighted, and how they came to be taught, learned, and naturalized among samba school members. The study analyzed actual performances through fieldwork, analysis of the organization of samba schools, and the historical facts that led to this organization. The study concludes that many roles are chosen and defined by age, body type, skin color, and behavior. Brunet also observed that women and/or homosexual men can now fill many roles that previously were filled by men only, showing an important evolution in cultural behavior. Brunet's conclusions emphasize how profoundly the music is attached to Brazilian culture and identity. This suggests that it is extremely important to integrate this understanding into the instructional process when seeking to prepare a truly authentic performance. When determining how best to teach non-native students, it is important to take into consideration their current understandings about Brazilian music – building on

associations with musical elements they already understand and then adding the new elements required for an authentic performance.

Knapp (2012) conducted a study with the purpose of assessing how undergraduate music majors' perception of authenticity and preference for teaching multicultural music were affected by multicultural music instruction. According to this study, authentic performances of a specific music style require native performers, the use of original instruments, the use of the original language specified by the composer, audiences consisting of members of the specific culture, and settings typical of the cultural environment. If one of these components is not present, the authenticity will be compromised. The instructor needs to be aware of how much compromise can be allowed before the original is lost. Although this study concluded that most undergraduate music majors received training in world music and there is a growing interest in multicultural music, results also suggest that 1) the students still lack the ability to make distinctions about whether or not performances are authentic and 2) teachers are still unprepared to teach such music.

Taking into consideration that most native Brazilians learn their culture's music via oral tradition (listening, observing more experienced players perform, and performing in pubs and other venues) rather than via formal education in a school, it seems clear that informal learning is responsible for much of the authenticity of Brazilian music. When teaching non-native students, therefore, this informal experience needs to be incorporated into the learning process. Adams (2014) investigated the value of implementing informal learning practices into the formal learning environment. According to Adams, informal learning happens when students are responsible for their own learning, often without the

presence of an instructor. This is typical for the learning of popular music styles. Although Adams study was focusing on incorporating informal music learning into music styles that are usually taught formally in school settings, this mixture of formal and informal learning could be extremely valuable to developing authenticity for the performance of Brazilian popular music styles. Adams concluded that students who were exposed to informal learning made connections in more ways than simply associating notation with instrument fingering, for example. These extra connections allow non-native musicians to develop a sense of musical context that is essential for authenticity.

According to the research, then, the achievement of authentic performances requires the recreation of as many authentic characteristics as possible. These characteristics include recreating not only the instrumentation but also the learning process. The instrumentation used in each style and their roles are important elements and, although some compromise may be necessary, students and instructors must be familiar enough with the styles to make the appropriate changes without losing the originality of each style. In terms of teaching authentic performance, it is important to consider the informal type of learning that native Brazilians engage in when learning their own music and to integrate this informal approach into the teaching process.

Music Cognition, Perception, and Learning Theory

While taking Psychology of Music as part of my doctoral studies, my interest in achieving a higher level of performance authenticity among drum set students led me to begin researching areas such as music perception, music cognition, and psychomotor learning theories. Specialized research in these areas provides important insights into the most effective and efficient approaches to developing the understanding and skill needed

for authentic performances of new musical styles. Research and learning theory related to audiation, modeling, musical imagery, motor theory, and practice strategies each play important roles in this learning process.

Audiation is a fundamental element of the learning process because "sound becomes music through audiation when, as with language, we translate sounds in our mind and give them meaning" (Gordon, 2012, p. 3). Building on Gordon's Music Learning Theory and integrating current perception and cognition research, Ester (2005) developed a teaching guide for music literacy entitled *Sound Connections*. This pedagogical approach was thoroughly developed with a learning sequence and the use of best-practice syllable systems, facilitating a series of cognitive connections by having students echo what they hear, then connect these aural patterns with syllable patterns, and eventually connect the syllable patterns with musical symbols. As Gordon states, audiation is not possible without prior aural perception; therefore, Ester's first step of echoing what is heard is foundational to any musical learning. Additionally, being able to vocalize musical patterns is an important step in the development of music literacy. According to Ester:

> The singing voice is the fundamental instrument for every musician because it is most closely linked to the musician's ear. … Being able to press the correct keys on the piano or clarinet in response to notation, for example, does not confirm that the performer can audiate the music. (p. 1)

Therefore, in order to provide musical understanding, it is necessary that both instructors and students are able to vocalize musical patterns. This project uses listening, audiation, and vocalization to develop musical understanding. Students need to be exposed to recordings in order to familiarize themselves with the nuances of the style to be studied.

Listening provides the prerequisite for audiation because "we audiate sound only after we have aurally perceived it" (Gordon, 2012, p. 3). Thus, audiation suggests storage and understanding, while vocalizing represents retrieval of the learned information: "In order to be verified as learned, entities must be retrieved from long-term memory. It is generally supposed that the process called retrieval requires that certain cues be provided, either by the external situation or by the learner" (Gagné, 1977, p. 73).

According to social learning theorist Bandura (1970), humans learn and form ideas about new behaviors by observing others' behaviors and the outcomes of those behaviors. Those who are observed are referred to as models, and Bandura labels this process *modeling*. Applied to this project, observing live or video performances of native Brazilians modeling authentic performance style facilitates the encoding of this information, which will in turn serve as a foundation for further learning.

Godøy takes the concept of modeling a step further, proposing a triangular model of cross-modality that emphasizes the "inextricable relationships between action, vision and sound in music perception and cognition" (p. 317). He observes that music appeals to many human senses beyond hearing alone. For example, sounds are often described using terms such as dark, low, and piercing that are related to eyesight or actions. According to Godøy, evidence is emerging that "we mentally imitate sound-producing actions when we listen attentively to music" (p. 318); these images of actions are referred to as *motor programs*. Godøy's resulting triangular model serves as the basis for *motor-mimesis*, which can be thought of as audiation but with the added simulation of movements: "Motor-mimesis translates from musical sounds to visual images by a simulation of sound-producing actions … forming motor programs that re-code and help store musical sounds in our

minds" (p. 318). Stated another way, the image of sound production has not only aural components but also visual and motor components. Through motor-mimesis, performers develop connections between sounds and movements. In other words, before they physically perform any of the musical patterns, they will visualize the movements (actions) that produce the desired sounds and then start to practice and perfect their motor skills.

The pedagogical approach developed during this project uses listening, audiation, modeling, and motor-mimesis to create a mental image, which functions as the basis for the motor skill development. Creating a mental image is perhaps more important than any verbal explanation because music "is an aural, aesthetic, nonverbal, perceptual-motor skill" (Kohut, 1985, p. 8). To develop their motor skills, students will be "making adjustments until one is able to imitate the model effectively or reproduce the mental image" (Criss, 2008, p. 44). The complete mental image is called Cognitive Motor-Imaging and it represents what the performers will try to recreate as the desired sound and the final goal. If the students focus only on technical aspects, the "performance might become sterile or mechanical" (Criss, 2008, p. 43). According to Criss, instructors can "give an image of the goal to the student and then encourage them to find their own strategies for imitating that image" (p. 44). The skills will then develop further and be consolidated during physical practice as students repetitively reproduce the model.

Effective and efficient practice strategies are crucial to refined motor skill development. Performing Brazilian popular music styles is a very demanding task in terms of motor skills and coordination, both in terms of the individual and the ensemble; this is especially true for drummers, pianists, guitarists, and others who may need to combine several patterns to create authentic grooves. Each pattern may include many musical facets

that were originally played by separate individuals. As research indicates, it is important to divide the process into smaller tasks because "when too much information is presented at once, our short-term memory becomes overwhelmed and unable to process it" (Luckner, 1990, p. 101). According to Tan, Pfordrescher, and Harré (2010), motor skills are developed more effectively via distributed practice: shorter practice sessions spread throughout the day. This distributed approach involves regular breaks, allowing for the "opportunity to take a fresh look at the music, and to understand its structure more deeply" (p. 186). Along with breaks, sleeping contributes to the consolidation of the motor skills because "the memory trace for motor learning continues to be reprocessed even during periods without intervening training" (p. 186). Gebrian (2015) summarizes a variety of research that supports the importance of sleep to the consolidation of motor learning:

> During a sleep spindle, there is a huge burst of electrical activity in a population of neurons that causes massive amounts of calcium to enter those cells. Calcium is what causes all the changes discussed earlier, from strengthening and weakening synapses, to making new synapses, to synchronizing the firing of neuronal ensembles. (p. 31)

The development of a pedagogy focused on motor skill development requires careful consideration of the available research in the areas of music perception, cognition, and learning theory. This includes analysis of the component tasks and determination of the most effective approach leading to synthesis. "If the component acts of a total skill have been previously well learned, a minimal amount of time may have to be spent in putting them together" (Gagné, 1985, p. 207). It seems clear that isolating and then reintegrating

musical understanding and motor skill development results in the most effective learning process. This suggests the importance of two separate but related learning sequences: a Virtual Learning Sequence and a Motor Learning Sequence. These served as the basis for the development of the proposed pedagogy.

CHAPTER 3

DESIGN AND METHOD

The purpose of this project was to develop and present a pedagogical approach to teaching the authentic performance of Brazilian popular music styles to non-native musicians. Chapter 4 of the dissertation provides a detailed presentation and explanation of the pedagogical approach, which includes teaching cultural background and context as well as pattern vocabulary and technical skills via the synthesis of two research-based learning sequences: the *Virtual Learning Sequence* and the *Motor Learning Sequence*. The Virtual Learning Sequence focuses on developing the stylistic aspects via listening, audiation, and vocalization; and building the foundation for the required motor skills via motor-mimesis, mental image, and mental practice. The Motor Learning Sequence focuses on developing the actual motor skills required to perform Brazilian popular music styles; this involved the development of the sequence in which patterns should be learned and the establishing of effective and efficient practice strategies. In addition to the detailed presentation of the pedagogical approach, a supplemental component of this project sought initial validation of the approach via the solicitation of expert observations of the performance authenticity of ensembles prepared using the approach.

Inception and Background of the Project

While working with different ensembles, which sometimes had native Brazilian students as well, I came to recognize a significant difference in approach between native and non-native students. The non-natives, regardless of their technical proficiency level, often had problems with proper inflections, feels, and approaches to basic patterns. As a percussionist, I was particularly interested in drum set performance of Brazilian music

styles and how to help my students develop not only a strong skill set but also an understanding of the feels and inflections that makes a performance authentic. While taking Psychology of Music, my interest in achieving a higher level of performance authenticity among drum set students led me to begin researching areas such as music perception and psychomotor learning theories. This resulted in a final paper that outlined some initial pedagogical ideas focused on addressing this challenge. This project involved the further development of these pedagogical strategies to teach not only drum set performers but also other instrumentalists who are non-native Brazilians.

Overview of the Initial Pedagogical Foundation

My research and writing in Psychology of Music focused on teaching drum set performance of Brazilian popular music styles and resulted in the development of two main learning sequences: the Virtual Learning Sequence and the Motor Learning Sequence. Each of those sequences was designed to develop different components of the whole skill set. It is important to approach each component separately because "if the component acts of a total skill have been previously well learned, a minimal amount of time may have to be spent in putting them together" (Gagné, 1985, p. 207). The Virtual Learning Sequence intends to develop understanding of both musical style and the skills involved by creating associations, which Gagné (1977) claims "seems to occur with such frequency that it deserves to be called a basic process" (p. 23). The Motor Learning Sequence develops and guides the practice of motor skills. This sequence is based on Edwin Gordon's Music Learning Theory, research on the approach to practice strategies and their relative impacts on motor skill development, brain hemispheres and structures used during each task, and the role of breaks and sleeping in the consolidation of motor skills.

During this project I further developed and detailed both learning sequences, focusing on how to teach Brazilian popular music styles to non-native Brazilians in general and how those sequences are combined during the learning process to effectively develop students' understanding and authentic performance skills. Synthesis of the two learning sequences facilitates teaching students who play instruments that require the combination of two or more patterns to create a more complex groove; these include drum set, piano, guitar, and vibraphone. In a similar manner, the blending of learning sequences is essential to integrate patterns played by different performers in an ensemble setting.

Chapter 4 of the dissertation provides a detailed presentation and explanation of the pedagogical approach. Figure 3.1 presents an outline of the structure of the approach and content of the chapter.

- Virtual Learning Sequence
  - Listening
  - Audiating
  - Vocalizing
  - Motor-mimesis
  - Cognitive Motor-Imaging
  - Mental Practice
- Motor Learning Sequence
  - Motor Skill Development
  - Practice Strategies

Figure 3.1. Proposed outline of *A Pedagogical Approach to Teaching Brazilian Popular Music Styles to Non-Native Musicians*.

The pedagogical approach is founded on the premise that each musical style is a language and the patterns that characterize each style are the words that constitute its basic vocabulary. Based on this premise, the Virtual Learning Sequence focuses on developing the stylistic aspects via listening, audiation, and vocalization; and building the foundation

for the required motor skills via motor-mimesis, cognitive motor-imaging, and mental practice. Listening develops the musical background. Like learning a new language, when students listen to a specific musical style, they will be listening to how the *words* (patterns) are used in the context and how they function inside the *language* (musical style), helping them to develop more autonomy. Audiation and vocalization were added to develop understanding of musical patterns that are important to each musical style. "Sound becomes music through audiation when, as with language, we translate sounds in our mind and give them meaning" (Gordon, 2012, p. 3). Vocalizing is important for retrieval of the learned information and it also is a "fundamental instrument for every musician because it is most closely linked to the musician's ear" (Ester, 2005, p. 1). Vocalizing is approached with the development of a simple syllable system, which assists students to associate and vocalize the patterns with appropriate inflections.

Motor-mimesis, cognitive motor-imaging, and mental practice constitute the second stage of the Virtual Learning Sequence. Motor-mimesis is a concept based on a triangular model that creates a "relationship between action, vision and sound in music perception and cognition" (Godøy, 2003, p. 317). It is developed like audiation but for motor movements instead of musical understanding, while cognitive motor-imaging provides a clear objective to be achieved, and mental practice functions as a bridge into the Motor Learning Sequence.

The Motor Learning Sequence focuses on developing the actual motor skills required to perform Brazilian popular music styles. During this pedagogical approach students develop the sequence in which patterns will be learned and how to approach the motor skills practice based on pattern complexity, duration of practice session, use of brain

hemispheres and structures, and the role of breaks and sleeping in transferring the learned material into long term memory.

Initial Validation of The Pedagogical Approach

Since completing the initial research and development of the drum set pedagogy to teach Brazilian popular music styles, I have been teaching Brazilian Jazz ensembles as well. I have applied aspects of the pedagogical strategies during the ensemble rehearsals. Elements like listening, audiation, vocalization, watching videos of authentic performances, motor-mimesis, and mental practice seemed to be effective for the development of more authentic performances on all of the instruments. A supplemental component of this project sought initial validation of the approach via the solicitation of expert observations of the performance authenticity of ensembles prepared using the approach. Sample recordings of ensembles prepared using the pedagogical approach were interposed with recordings of native ensembles and non-native ensembles that were not exposed to this approach. Once IRB approval was obtained, a small sample of Brazilian popular music experts were invited to listen to the recordings and complete a brief questionnaire (see Appendix C) that solicited Likert-scale ratings related to technical skills and authenticity.

Chapter Summary

The lack of stylistic authenticity in performances of Brazilian popular music by non-native musicians is a significant and often-cited issue. This dissertation project provides a detailed presentation and explanation of a research-based pedagogical approach to teaching the authentic performance of Brazilian popular music styles to non-native musicians. A supplemental component of this project sought initial validation of the approach via the solicitation of expert observations of the performance authenticity of ensembles prepared using the approach. This project benefits non-native Brazilian

musicians who desire to develop an in-depth understanding of how to perform Brazilian popular music styles and music teachers who wish to reduce or eliminate the gap of stylistic authenticity between native and non-native performers of Brazilian popular music.

CHAPTER 4
THE PEDAGOGICAL APPROACH

Introduction

The lack of stylistic authenticity in performances of Brazilian popular music by non-native musicians is a significant and often-cited issue. Several native Brazilian musicians with whom I have worked in the United States consistently commented that there is a large gap in this performance authenticity between native and non-native musicians. This project will benefit non-native Brazilian musicians who desire to develop an in-depth understanding of how to perform Brazilian popular music styles. It will also be valuable for music teachers, providing them with pedagogical strategies to reduce and possibly eliminate the authenticity gap between those two groups. This pedagogical approach provides in-depth guidance on the development of music awareness, authenticity, and motor skills in both applied lesson and ensemble settings.

The approach is divided into two main learning sequences: *The Virtual Learning Sequence* and *The Motor Learning Sequence*. The first has the purpose of developing musical understanding through listening, audiating, vocalizing, observing, and motor-mimesis. After completing those steps, students will be able to synthesize these five elements into what I label *Cognitive Motor-Imaging* (CMI): mental imagery that combines and associates the five virtual-learning elements and serves as the foundation for the motor skill development. CMI combines musical knowledge with elements of motor–mimesis, enhancing students' capacity to effectively use mental practice throughout the entire learning process. The second sequence – the Motor Learning Sequence – will develop the actual motor skills through two main steps: motor skill development in which musical

patterns should be approached in a determined order, and then practicing each musical pattern separately through a series of strategies that will optimize the time spent on each task. Lastly, the Virtual and Motor learning sequences will interweave, creating strategies to combine multiple patterns, solidifying concepts and techniques, and progressively developing more complex skills, independent thinking, and higher levels of authenticity for each style of Brazilian popular music.

When approaching Brazilian popular music styles, which typically involve several overlapping rhythmic patterns played on percussion instruments, musicians are required to not only play what is on the page but also understand each pattern present in the whole structure. In addition, it is necessary to understand the cultural aspects of the specific style and how it is played in its original setting in order to enrich performances and reach authenticity. It is important to consider how perception, cognition, cultural experience, and personal background affect the learning of the material and how to effectively transfer the patterns from the original setting to a given instrument as well as to the overall ensemble setting. Likewise, associations will be created connecting each step of the learning process. "Association is one of the processes that occurs in learning. Furthermore, association seems to occur with such frequency that it deserves to be called a basic process" (Gagné, 1977, p. 23). Because many Brazilian genres are derived from percussion settings and/or developed from styles originally set for percussion only, they often involve complex rhythmic patterns. Students and instructors who play and/or teach drum set, piano, guitar, bass guitar, and other rhythm section instruments will face important decisions. Such instruments often combine rhythmic patterns to create grooves, which may or may not be appropriate for a given situation. Therefore, decisions should be made about which grooves are appropriate and/or the best fit for each setting. Choice of timbres might be involved as

well, in an effort to best depict the original percussion instruments on the various rhythm instruments. That is especially important for drum set, which is the closest instrument to the original settings. Melodic instruments will have a completely different role, of course, but those musicians must also acquire in-depth knowledge of feel, inflections, and main patterns that characterize each style. Those elements often get lost during the development of demanding motor skills, leading students to become technically proficient but with limited authenticity and musical awareness. Therefore, this pedagogical approach is designed to optimize the time spent on the process of learning Brazilian popular music styles by developing depth in authenticity, musical awareness, and motor skills through a series of research-based steps. Students will develop authenticity and musical awareness first, then apply that knowledge during the motor skill development. This sequence will allow students to develop a sense of contextualization and become able to create their own generalizations in each style approached.

Overview of the Pedagogical Approach

It will be helpful for the reader to first encounter a general overview of the entire process and become familiar with the main steps of the approach. Each step is relatively short and the steps must occur in the sequence in which they are presented; however, some will occur in an almost simultaneous manner. The main steps of the Virtual Learning Sequence and the Motor Learning Sequence can be seen in Figure 4.1, which is designed to provide an overview of the pedagogical steps that lead to an authentic performance. Prior to any motor skill development and physical practice, students should become fully aware of every aspect of what they are trying to achieve. Therefore, both instructors and students should follow the detailed instructions for each step of the Virtual Learning Sequence (VLS) before approaching the Motor Learning Sequence (MLS).

- Virtual Learning Sequence
    - Listening
    - Audiating
    - Vocalizing
    - Observing and motor-mimesis
    - Cognitive Motor-Imaging (CMI)
    - Mental practice
- Motor Learning Sequence
    - Motor skill development
    - Practice strategies

Figure 4.1. General summary of the pedagogical approach.

The overall goal of this pedagogical approach is to use the Virtual Leaning Sequence to create a strong and in-depth foundation where the students will have all the tools necessary to understand the music they are learning, understand how the sounds are produced, and develop the actual motor skills. It is also important that students understand and learn the process, so they can use it in everyday practice to become independent musicians. My experiences as a teacher have led me to conclude that it is very effective to briefly explain this approach to the students prior to the actual teaching of any Brazilian popular music style. Here is a brief transcription of what I tell my students before we start working on the music:

> The first step to learn this style is to listen to many songs in the style. First, you can listen to the playlist while doing other activities such as walking, cooking, working out, etc. After that, we will break down the style to its basic patterns to learn each one separately, so you can understand the "words" [patterns] that constitutes this language [style]. After becoming familiar with the basic patterns, you will listen to songs again and try to recognize such patterns; however, some variations may happen and I will provide further

guidance. After listening, we will select one pattern to work on and we will follow several steps to develop this pattern. After listening to the selected pattern, you will audiate it, meaning listen to it in your head without the sound being physically present. It is similar to having a song stuck in your head. After audiating, you will sing the pattern with syllables that are assigned to it. Sometimes, you will realize you are not singing it the way you hear it in your head [audiate], but you will try again until you do. The next step is to associate sounds with motions. For example, if someone knocks on our door, we will not see it happening, but we know, based on what we hear, how that sound was produced, correct? Conversely if I do this [move my hand like knocking on the door] you would be able to audiate the resulting sound, correct? You audiated the sound and you associated it with the motion. We will build the same connections between musical patterns and technique, associating motions with the specific sounds we are trying to produce. When you are able to have all those elements in your mind (listening, audiating, vocalizing with syllables, and associating motions with sounds), you have a mental imagery of what you are trying to achieve. During the practice time you will try to reproduce that image using strategies that will optimize the time spent in the practice room.

The preceding narrative is an introductory explanation of each step and it helps students with their first contact with this pedagogical approach used to teach Brazilian popular music styles. The reader should keep the overall structure from Figure 4.1 in mind and revisit it frequently to become familiar with the main steps. Each new pattern

presented will be learned through the same process of listening, audiating, vocalizing, and associating sounds with motions by creating a mental picture. This Cognitive Motor-Image (or CM-image) will serve as the foundation for both mental practice and actual physical practice in the MLS. This pedagogical approach is used in a cycle, repeating itself for every new pattern. Moreover, it is also used to combine patterns, creating complex grooves composed of two or more simultaneous patterns, depending on the instrument the student plays. The following pages present in-depth information about each step of the Virtual and Motor learning sequences, resulting in a comprehensive approach to teaching Brazilian popular music styles in different settings.

The Virtual Learning Sequence

The Virtual Learning Sequence (VLS) is designed to develop musical awareness, authenticity, and associations between sound and actions. The VLS is completed prior to any physical practice and technical development. Its steps enable students to develop a series of associations to facilitate the eventual motor skill development. The steps of the VLS, as shown in Figure 4.2, are listening, audiating, vocalizing, observing and motor-mimesis, cognitive motor-imaging, and mental practice. Although mental practice is part of this sequence, it should be considered as a connector between the VLS and the MLS. The VLS is designed to develop aspects related to authenticity and it does not include physical practice and motor skill development. Each step develops specific skills that are required to achieve an authentic performance and eventually associate it with motions and technique, but this does not yet include actual physical practice. Listening develops musical background and vocabulary. Audiation develops musical awareness and an increased understanding of how each pattern should sound within the style. Vocalizing is meant to develop proper pattern inflection and assist in storing learned information in long-term

memory. Observing and motor-mimesis creates associations between sounds and the technique that produces each sound. Cognitive motor-imaging is a synthesis of the prior steps: Students develop a mental imagery of themselves performing while audiating the sound associated with a particular pattern. Once this image is created, students will mentally practice each pattern before moving to the MLS.

The Virtual Learning Sequence

- Listening
    - Passive listening
    - Pattern listening
    - Recognition listening
- Audiating
- Vocalizing
- Observing and Motor-mimesis
    - Imitating
    - Motor-mimesis
- Cognitive Motor-Imaging (CMI)
- Mental practice

Figure 4.2. The Virtual Learning Sequence.

Listening

The first step in developing an authentic performance is to listen to music; this will develop the necessary musical background and allow performers to start contextualizing the musical elements. Audio files corresponding to the figures in this document can be found at:

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples

These audio examples will be extremely helpful during the learning process. Each specific style will require guided listening to songs that are representative as well. For example, "*Garota de Ipanema"* (Girl from Ipanema) is one of the most representative tunes of the

bossa nova style. A listening guide is included in Appendix A to assist the reader with this step.

As the students start their studies, the first step is to be exposed to the style and listen to as many recordings as possible. The culture has an important role in the development of the musical experience of each individual; many "cognitive psychologists would admit that culture plays some significant role in the actions, thoughts, and feelings that are involved in musical experience" (Tan, Pfordrescher & Harré, 2010, p. 281). Also, listening will help to develop musical vocabulary because the "more tonal patterns and rhythmic patterns students have in their listening, performance, and audiation vocabularies, the better they will conceptualize from and form generalizations about music they hear or produce" (Gordon, 2012, p. 99). Like learning a new language, when students listen to a determined style, they will be listening to how the *words* (patterns) are used in the context and how they function inside the *language* (musical style), helping them develop more autonomy. To assist the vocabulary development, this document offers a series of patterns for the five Brazilian popular music styles addressed in this pedagogical approach. Appendix B presents a basic vocabulary for samba, bossa nova, choro, baião, and maracatu. Sample audio files of each of these patterns can be accessed at: https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples

Most of the VLS treats a musical style as if it were a language: each component, as part of the full skill set, will be carefully developed. According to Gagné (1985), "if the component acts of a total skill have been previously well learned, a minimal amount of time may have to be spent in putting them together" (p. 207). The listening component is important for two reasons. First, it will allow students to audiate: "we audiate sound only after we have aurally perceived it" (Gordon, 2012, p. 3). Second, it provides the experience

necessary to truly understand the musical style. Native Brazilian musicians are exposed to the musical culture everyday. As a native Brazilian who grew up in the country, I experienced daily exposure to the most varied types of popular music styles in the streets, stores, bars, and theaters and on the television and radio. This involuntary exposure helps to create a rich musical background that translates to facilitation during the learning process, providing elements that contribute to authenticity. In Brazil, the people are exposed to many different musical styles everyday. When translating this informal learning to a formal instructional setting, however, it is important to focus on only one style at a time to avoid confusion among the unique musical patterns. For example, if the student is learning about samba, it is crucial that this student is exposed to *samba enredo*, which is the music played by the samba schools from Rio de Janeiro and São Paulo. The samba enredo is mostly performed by Brazilian percussion instruments accompanied by string instruments such as guitar, cavaquinho (Brazilian small guitar similar to a ukulele), bandolim (Brazilian version of the mandolin), and voice. Regardless of which instrument the student plays, the samba enredo contains musical patterns that must become part of the musician's vocabulary. Additionally, students must be exposed to groups and artists who perform other variations of samba in different musical settings, thereby helping to expand their vocabulary. Due to their unique traits, styles like bossa nova and choro should be approached separately; they are different dialects (to continue the language metaphor) and may sound similar or even the same to novice ears. Samba, bossa nova, and choro share several rhythmic patterns, but they are significantly different in inflection. The proper inflection of patterns will generate the right feel of the style, making it authentic. For the purposes of this pedagogical approach, inflection references the fact that, within a given musical pattern, some notes are slightly stronger or weaker than others. Like in language,

different words in a sentence can be emphasized to slightly change the meaning of the sentence. For example, take the phrase “he is playing music.” Say it out aloud several times, emphasizing a different word each time. First, “HE is playing music,” then “he IS playing music,” then “he is PLAYING music,” and finally “he is playing MUSIC.” Although it is the same phrase with the same words, the overall meaning may change depending on which word has a stronger inflection. The same happens with music and musical patterns. Inflection should be carefully approached and understood so that students can reach a higher level of authenticity in each style. This can be a difficult concept to develop; therefore, the listening guide of each style must be carefully chosen (see Appendix B for a suggested listening guide). The listening portion is divided into unique three steps: passive listening, pattern listening, and recognition listening.

Passive listening. First, students should listen to authentic music to become familiar with the style and establish a basic background. This should focus on listening to Brazilian music played by native Brazilian musicians so that performers can listen to the most authentic sources; however, the fact that a musician grew up in Brazil and plays Brazilian styles is not the only element that brings authenticity. The repertoire must contain renowned musicians who are representative and contributed to the development of the style. In simple terms, this is a passive step where students need to listen to music and be exposed as much as possible. Passive listening does not require listeners to be fully attentive to the music; they can listen while doing other activities such as dishes, laundry, homework, etc. This step is about being exposed to rather than studying the music; this will provide the basis for future associations and for audiation. The more exposure, the easier it will become to audiate and contextualize musical patterns; therefore, it is recommended

that students listen to the musical style they are learning everyday, regardless of which stage of the learning process they are in.

Pattern listening. The second listening step is to isolate the main patterns and listen to them separately (see Appendix B and access audio files). For example, students learning how to play maracatu would have their instructor break it down to its main patterns and listen to how each one of them is played, so that they learn about subtle inflections of each pattern and the feel of the style. Keep in mind that some styles may have considerable variations that create sub-genres, such as *maracatu de baque virado* or *maracatu de marcação*. The patterns can be presented to the students in many ways: short samples, instructor performs for the student during a lesson, etc.

Recognition listening. The final step of the listening portion is to listen to songs again. The listening guide in Appendix A provides representative repertoire and can be used again during this step. Students will actively listen to the tunes from the listening guide, now attempting to recognize the patterns in context that they previously listened to in isolation while being attentive to possible variations. Assistance from an instructor and/or more experienced players will be important during this step. This type of relation is, according to Vygotsky (1978), the zone of proximal development (ZPD): "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Because most Brazilian popular music styles have their main patterns played and varied in ways that even experienced native performers may have difficulty recognizing, this type of guidance will be essential to students who must recognize patterns, variations, and characterizing aspects such as inflections and feel. Another important characteristic of many Brazilian

popular music styles is that patterns are not played and repeated throughout the songs (like the clave pattern is in some Latin music styles, for example). When performing Brazilian popular music, if there is a recurrent pattern that is not varied or changed at all during an entire song, that song will generally *lack* authenticity. While there are exceptions to this, pattern variation is an important element for authenticity and it is present more often than not.

Audiating

Audiation will help students attach meaning to music and musical patterns. Audiation "takes place when one hears music silently, that is, when the sound is not physically present" (Gordon, 2012, p.11). It is important for musicians in general and should be encouraged by teachers in order to fully develop students' musical potential. "Sound becomes music through audiation when, as with language, we translate sounds in our mind and give them meaning," and audiation is "integral to both music aptitude and music achievement" (Gordon, 2012, p. 3). It might seem odd that it would be possible to give meaning to several rhythmic patterns in isolation; however, that is exactly where the main issue resides when it comes to authenticity. Many musicians with enough music reading and coordination skills could perform Brazilian popular music grooves from a method book, playing along with recordings – but would that alone produce authentic performances? Without creating a musical background and developing audiation skills, musical patterns, melodic lines, or even chord changes are just technical elements that alone will not generate music and style. "Being able to press the correct keys on the piano or clarinet in response to notation, for example, does not confirm that the performer can audiate the music" (Ester, 2005, p. 1). For example, consider the example of a music instructor teaching jazz on drum set to a Brazilian or a non-native American student

through a method book. Assuming this student has no technical issues and is a proficient music reader, it would be safe to assume this student would likely be able to reproduce what is on the page rhythmically correct. See Figure 4.3 for an example of a jazz exercise on drum set.

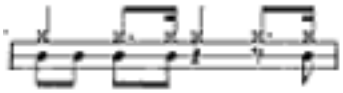


Figure 4.3. One-measure jazz exercise on drum set.

Now consider another student who had never heard of jazz and had never listened to jazz tunes. The student might be able to perform the example in Figure 4.3; however, would she play with swing since there is nothing that references that? Would she perform beats two and four with the appropriate feel of the style? Lastly, would the student know that, on beat two, both the top and the bottom voices are supposed to be played exactly the same even though they are notated differently? Very unlikely. The listening step will help students develop the requisite background and allow them to audiate the exercises presented on the page and the music they are learning, leading to a more authentic performance of each Brazilian music style they approach.

Development of meaning. In order to develop meaning with musical patterns, one can relate audiation to the act of reading a book. When reading the text, words immediately become meaningful to the educated reader. The reader is audiating the words, phrases, and paragraphs. The same should happen while reading music: patterns are parallel to words, while individual notes are parallel to single letters. If one tries to read a text letter-by-letter, it would not be a very E-F-F-E-C-T-I-V-E approach to reading and would not facilitate comprehension. The same applies to music when musicians try to read each single note

rather than the rhythmic patterns and/or melodic motives. By listening to isolated patterns, the students will become adept at audiating them with proper inflections and stylistic feel – in short, with meaning.

Solidifying rhythmic patterns. Rhythmic patterns are fundamental to any Brazilian popular music style and "the manner in which each rhythm pattern is audiated and performed, in association to some degree with tone quality, melodic and harmonic implications, dynamics, and tempo, contributes formatively to establishing style in music" (Gordon, 2012, p. 174). During this stage, it is important to keep listening to recordings and start audiating patterns separately to create a strong and authentic background. From an instructor's perspective it is difficult, if not impossible, to assess if students are audiating the patterns correctly; however, it is necessary to encourage them to do so and give them time to think and create their own ideas about the patterns they heard during the listening step. Keep in mind that audiation is only possible after being exposed through listening, and the more exposure the easier it will be to audiate.

Vocalizing

Vocalizing will be an important tool for students who are learning Brazilian popular music styles. They should be encouraged to vocalize and sing their parts in order to retrieve and solidify the recently learned materials. Every student, regardless of which instrument they play, should be encouraged to vocalize the basic rhythmic patterns played by percussion instruments. Vocalizing the patterns is extremely important since "the singing voice is the fundamental instrument for every musician because it is most closely linked to the musician's ear" (Ester, 2005, p. 1). The vocalization step should be approached immediately after audiation. First, students should be given time to audiate what they heard and then asked to vocalize what they just audiated. The audiation step

focuses on listening and will allow the development of musical understanding, while vocalizing confirms retrieval of learned information. "In order to be verified as learned, entities must be retrieved from long-term memory. It is generally supposed that the process called retrieval requires that certain cues be provided, either by the external situation or by the learner" (Gagné, 1977, p. 73). When students or performers vocalize the rhythmic patterns of a specific Brazilian popular music style, instructors and the students themselves can verify that the material was learned properly.

Vocalizing with a syllable system. The use of an effective syllable system for the vocalization of patterns is very important to the process of association. Several syllable systems are used in music education. A few examples include *takadimi* or counting for rhythm patterns and various tonal systems that apply solfege: fixed *do* or moveable *do* with *do*- and *la-based* minor options, for example. These systems help students make associations, learn, and reinforce learned materials. In Brazilian styles the use of syllables are also very common. Several words are loosely used as musical terms and associated with specific patterns or styles. Words like *ziriguidum, maracatu* and *telecoteco,* which are not actual terms in Brazilian styles, can be associated with different patterns and musical styles. Telecoteco (pronounced teh-leh-coh-teh-coh) is commonly used in samba and it "can be thought of as an equivalent to the clave in Afro-Cuban music. Often implied and not heard, it is an organizing pattern that functions as a timeline" (Monteiro, 2015, p. 52). Telecoteco is an onomatopoeic vocalization of the *tamborim* (Brazilian drum) pattern, which is used as shown in Figure 4.4.

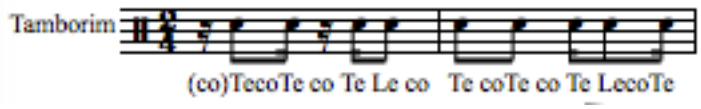


Figure 4.4. Telecoteco pattern. Access audio samples

The "*Te"* and "*Le"* syllables fall on the actual written notes, which are usually played with a stick, while all the "*co"* syllables fall on the remaining 16th-note-subdivisions, which are usually tapped by the middle finger of the hand holding the instrument. This is the only pattern in samba that has syllables attached, and it can be helpful during the learning process. Therefore, at this stage students should be given a series of syllables that will be associated with specific sounds. During my teaching career, I have developed the syllable system shown in Table 4.1; these are onomatopoeic sounds associated not only with the instrument but also with proper inflections. Access the audio samples for Table 4.1 to hear the pronunciation of the syllables.

Table 4.1

Rhythm Vocalization Syllables

Syllables	**Instruments associated**
Tu	1st, 2nd and 3rd surdos, alfaia, zabumba lower sound (low drums)
Tum	1st and 3rd surdos, alfaia, zabumba lower tone (low drums)
Ts	Chocalho, shequere (shakers),
K	Chocalho, shequere (shakers), triangle
TeLecoTeco	Tamborim (small frame drum traditional from Brazil)
Ke	Gongue (Instrument similar to a cowbell)
Pa	tarol, caixa (types of snare drum), zabumba higher tone,
Bzz	Tarol, caixa (when rolling on these instruments)
T	Chocalho, shequere (shakers), triangle
Tin	Triangle
Gi	Triangle
Keh	Higher tones of woodblocks and agogo bells
Koh	Lower tones of woodblock and agogo bells

The syllables are combined in different ways depending on which pattern is being learned. I developed this system to help students understand the proper inflection of each pattern, which will help not only with establishing associations and storing the learned material in long-term memory but also with developing authenticity. For example, a common pattern of the 3rd surdo (low drum used in samba) is shown in Figure 4.5. Although this is only one drum, the pattern will have different syllables depending on its inflection.

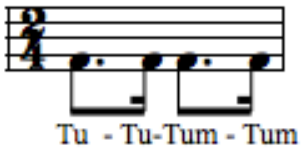


Figure 4.5. 3rd *surdo* pattern. Access audio samples

To fully understand the application and pronunciation of the syllables, it will be very helpful to listen to audio samples. Each figure that requires vocalization and is part of the vocabulary has a corresponding audio sample at: https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples Also, the vocabulary patterns in Appendix B can be accessed on this same web page. The following explanations are simply attempts to clarify the use of the syllables and their associations with specific sounds and pattern inflections; the audio samples will be the best guidance for understanding and making clear syllabic associations. The audio and visual materials are, perhaps, even more important than any attempt at written or verbal explanation because music "is an aural, aesthetic, nonverbal, perceptual-motor skill" (Kohut, 1985, p. 8). Visual materials can be any source in which the student can see how something is performed. Examples of visual materials are instructor modeling, YouTube videos, and live performances. Each syllable is associated with a type of sound: for example,

the syllable *"Tu"* is associated with a short note on low drums, while the syllable *"Tum"* – also associated with low drums – will represent a long note with more weight to it. Note that, for our purposes, the word weight is referring directly to the emphasis that relates to the inflection within a pattern. In jazz, for example, beats 2 and 4 have more weight than beats 1 and 3. Regardless of the style, these two syllables should be associated with low drums. If the student is working on samba, the syllables *"Tu"* and *"Tum"* will be used to learn the patterns of the 1st, 2nd, and 3rd *surdos.* If the student is working on maracatu, those syllables are associated with the *alfaia* (the low drum used in maracatu). The syllable *"Pa"* is associated with *caixa* (a type of snare drum) in samba, the high tone of the *zabumba* (a traditional Brazilian drum with a low and a high tone) when playing *baião*, the *tarol* (a type of snare drum) in the Maracatu, and similar instruments. *"T" and "K"* are associated with shakers and the triangle for softer and shorter notes. *"Ts"* will be used on shakers for notes with more weight and are slightly longer (the sound is not longer, but it should be audiated as a longer note). The syllables *"Tin"* and *"Gi"* on the triangle have a similar inflection. They have more weight; however, on triangle they are actually longer. When playing triangle, the performer can muffle the instrument by holding it with all fingers as well as produce a longer note by opening the hand that holds the instrument, thereby allowing for more resonance. Muffled notes are associated with *"T"* and *"K"* while open notes are associated with *"Tin"* and *"Gi". "Ke"* is associated with the gonguê (an instrument similar to a cowbell). Lastly, *"Keh"* and *"Koh"* are associated with woodblocks and agogo bells – the first syllable for higher pitches and the second for lower pitches*.* Figures 4.6, 4.7, and 4.8 show examples of the syllables used in basic patterns of samba, maracatu, and baião, respectively.

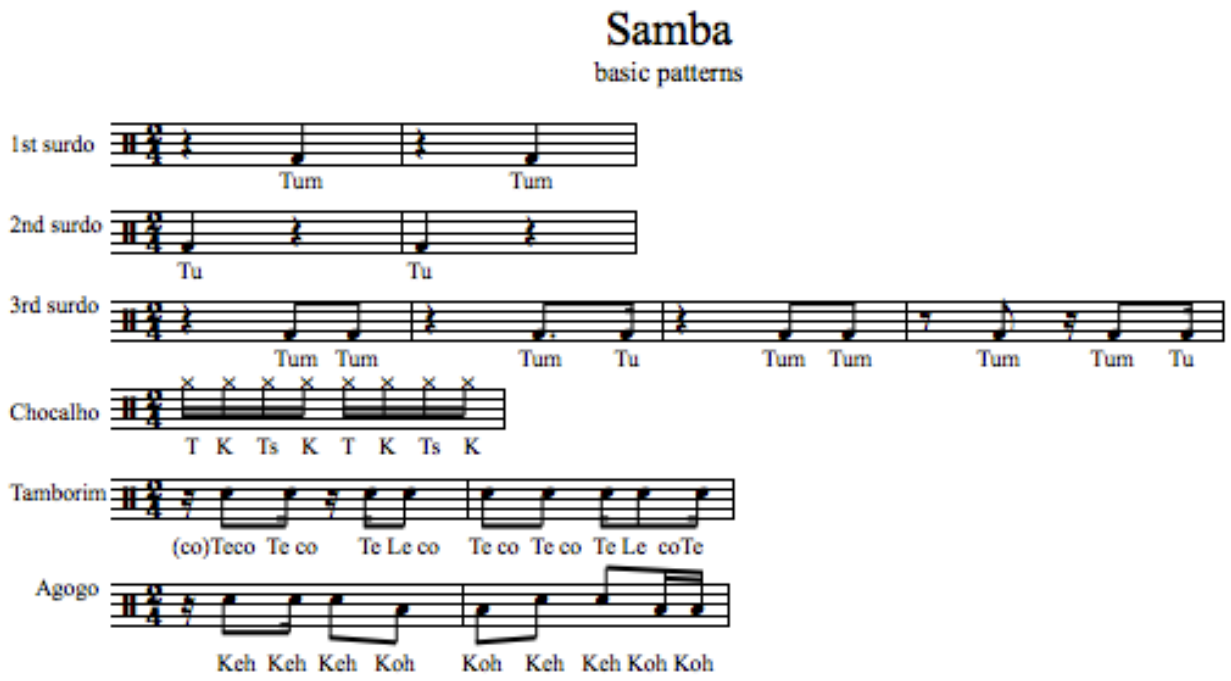


Figure 4.6. Samba basic patterns. Access audio samples

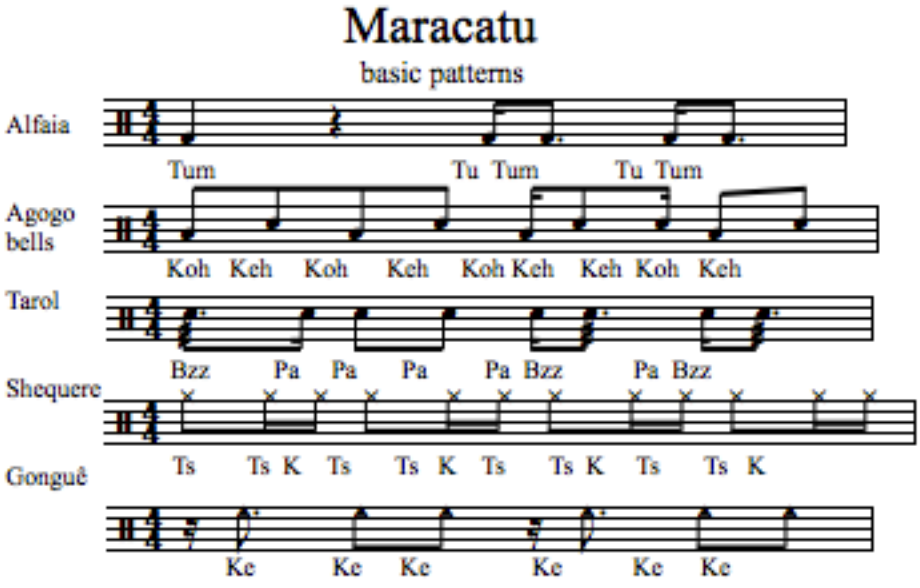


Figure 4.7. Maracatu basic patterns. Access audio samples

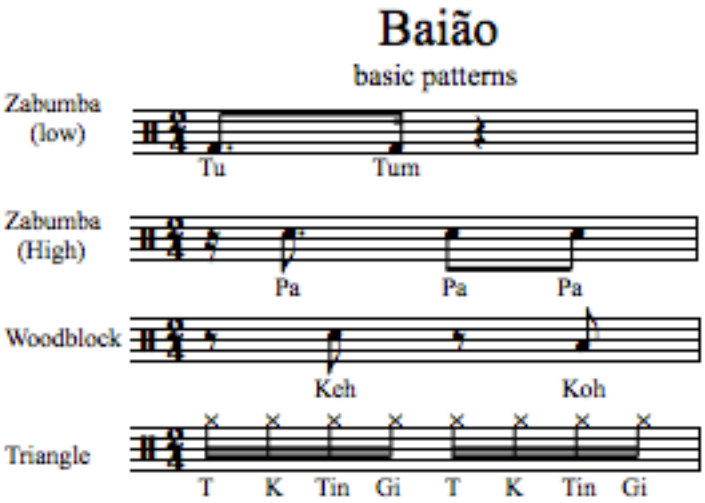


Figure 4.8. Baião basic patterns. Access audio samples

After listening, audiating, and vocalizing, students should have a much more complete understanding about the style they are learning. Again, it is critical for authenticity that students work on only one style at a time so that they can focus on the appropriate pattern inflections in each style. Pattern inflection is a key element and students should be very attentive during the learning process, especially with the patterns that are rhythmically the same. One example is the gonguê pattern of the maracatu (see Figure 4.7) and high zabumba pattern of baião (see Figure 4.8). Although they are rhythmically identical, the syllable used for each pattern is different, as is the resulting inflection. In this particular case, the patterns are performed on completely different instruments. Also, the gonguê pattern has more weight on the dotted-eighth notes, while the zabumba high pattern has more weight on the last eighth note – the second eighth note of beat two. Once students become familiar with the style by listening to authentic music, audiating isolated patterns and the music itself, and vocalizing associated syllables with each pattern, they will develop an authentic vocabulary. The next step is to observe more

experienced players performing. Through observing those players, students will start associating movements with the sounds previously developed.

Observing

After vocalizing, students will begin to observe videos and performances that can serve as models. Watching more experienced players will help the students develop the understanding and consciousness of the types of motions that should be used when performing. This process will be developed through motor-mimesis, which is like audiation for motor skills. Students will consciously think about the action that creates each specific sound they are trying to perform.

Imitating. Before actual physical practice and performance, students need to understand how to produce the desired sounds and inflections related to the patterns in the style they are learning. They can benefit from modeling: "from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action" (Bandura, 1970, p. 22). When we refer to drums, which are the basis for most Brazilian popular music styles, students need to learn and understand how different sounds can be produced on the same drum. Different timbres are used to perform the patterns that are later combined to create a music style. In order to understand the different timbres that can be produced with each instrument, it is necessary to observe actual performances so that students can see how each pattern is played in its original setting. This visual component can be transferred from and applied to any instrument. For example, a clarinet student can watch videos of a samba school *bateria* (percussion ensemble) to better understand the inflections of each pattern and overall feel of samba, allowing him to eventually apply that feel to the melodic line to be performed. Also, the same clarinetist could watch renowned Brazilian clarinetists and watch for

performance practices such as embouchure, breathing patterns, and common fingerings. According to Bandura, humans learn and form ideas about new behaviors through modeling. Observing others performing music helps to encode information during the learning process.

Motor-mimesis. Based on the motor theory of perception as initially developed in linguistics, "we mentally imitate sound-producing actions when we listen attentively to music" (Godøy, 2003, p. 318). According to Godoy this theory

> … was first used in linguistics as it became clear to some researchers that a purely signal-based model of perception was not going to work and it would be more fruitful to suggest that listeners also make an internal image of how the sounds were assumed to be produced. (p. 318)

Godøy (2003) developed a triangular model that associates sound, action, and vision. According to the model, there is a "relationship between action, vision and sound in music perception and cognition", and "any sound can be understood as included in an action trajectory" (pp. 317-318). This model serves as the basis for motor-mimesis, which students can think of as the visual parallel to audiation. Motor-mimesis can be applied in two different ways. First, when listening to sounds, it is possible to imagine the action that produced it. For example, when a pianist listens to a major scale on the piano, she can imagine the fingering used to perform the scale. Secondly, a sound-producing action can lead to audiation when the same pianist performs that fingering on a table. During the action of fingering the table, he will be able to mentally hear the scale associated with the fingering. That happens because "actions can translate from the sonic to the visual and, conversely, from the visual to the sonic" (Godøy, 2003, p. 318). Through motor-mimesis, performers develop connections and associations between sounds and movements; before

they physically perform, they will have a clear image of how to do so. When they start practicing and perfecting their motor skills, they will be recreating these images.

The motor-mimesis should be applied to each pattern separately in order to develop clear associations between vision, sound, and action. Motor-mimesis will also be used during mental practice, which can be very useful in many situations. Throughout the learning process, especially during listening, students can imagine the actions associated with each pattern or melodic line and practice mentally using elements of motor theory, "forming motor programs that re-code and help store musical sounds in our minds" (Godøy, 2003, p. 318). Before using mental practice, however, students need to develop cognitive motor-imaging, which is the next step after motor-mimesis.

Cognitive Motor-Imaging

Cognitive motor-imaging (CMI) is a synthesis of the prior components of the VLS: listening, audiating, vocalizing, observing, and motor-mimesis. In order to successfully develop CMI, students will need to create strong associations that will connect all the elements of each individual pattern they learned. The main purpose of CMI is to synthesize all prior steps, condensing them into a mental imagery that will serve as the foundation for both mental practice and actual physical practice. Additionally, students will start developing their own ideas about the music they are learning to perform and they should create as many associations as possible to develop authenticity and motor skills. There are different levels of CMI; each one provides different levels of associations. A cognitive motor-image (CM-image) can be developed for a simple rhythmic pattern or for combinations of two or more patterns, creating complex grooves that characterize a style.

The levels of CMI. Conceptually, there is no restriction to the number of CMI levels that can exist. Each level represents the number of patterns included in the CM-image and

it will relate to the development of grooves composed by two or more patterns. For example, if a student is in the beginning of the process and learning one pattern at the time, she will develop a series of Level 1 CM-images (since each image has only one pattern), which are treated as the basic vocabulary of a specific style. Once the vocabulary is developed, students will move forward and start to combine two, then three, then four patterns. A Level 2 CM-image will be composed of two patterns, a CM-image with three patterns will be Level 3, and so on. Conceptually, it is possible to develop CM-images with as many patterns as possible and students should do so in order to develop each style to the highest levels; however, it is unlikely that one performer would be required to physically play more than four patterns simultaneously. For example, melodic instruments play melodic lines most of the time; sometimes they perform accompaniment lines that may synthesize two patterns. Rhythmic/harmonic instruments possibly have grooves combining two or three patterns, while drummers and percussionists can have grooves combining up to four patterns simultaneously. Any more than four patterns would be rare and, if attempted, several compromises would have to be made; therefore, it would generate an inauthentic performance. Again, it is still conceptually acceptable and even encouraged to develop CM-images with a full orchestration of patterns, but anything with more than four patterns would not be performed by one person alone.

CMI Level 1. The first level of CMI involves creating an image of a single pattern. For example, a student who is learning about samba would listen to authentic performances of samba songs and listen to the main patterns in isolation. One of the main patterns is the 1st surdo pattern shown in Figure 4.9:

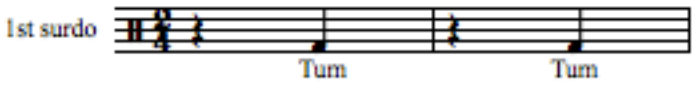


Figure 4.9. 1st surdo pattern. Access audio samples

After listening to this pattern, students would begin to understand its inflection. It is a long note with some emphasis due to the fact that beat two is slightly stronger than beat one in this style. After becoming familiar with the pattern – audiating and recognizing this pattern in other samba tunes – the student will create a first association, in this case with the syllable "Tum", and then begin vocalizing it. The next step is to observe how this pattern is played, including what kind of motion produces that specific sound. This step creates associations between sound, vision, and action (motor-mimesis). These associations will allow students to imagine themselves performing that pattern while audiating it with the appropriate syllable and inflection. It is a fairly straightforward procedure: listening + audiation + syllable association + motor-mimesis = Cognitive motor-imaging. The CMI happens when one mentally visualizes performing simultaneous with audiating the resulting sounds of the mental performance. Instructors who are teaching Brazilian popular music styles can present the basic patterns of a particular style in a one-hour lesson, assuming the student is familiar with the style as a result of the prerequisite listening to correlated songs prior to that lesson. All students who are learning Brazilian popular music styles, regardless of their performance instrument, need to develop CMI Level 1. In addition to that, it would be extremely valuable to learn some basic performance skills on the percussion instrument on which that pattern is originally performed or a similar instrument that closely relates to the original. If the instructional setting does not allow for either of those possibilities, it can also be valuable to at least try to air-play with a

mallet or appropriate stick in order to develop a minimum familiarity with the foundations of each style.

It is important to note two important facts about CMI. First, there is not yet actual performing or physical practice. Students will develop the motor-mimesis component – visualizing the motions involved in performing the pattern(s) – but they will not physically execute these motions while developing the CM-image. For example, if you think about the action of slamming a door, the action can become attached to a specific sound that is audiated while visualizing that action. During CMI there is no actual door slamming or physical sound present; rather, it is possible through one's life experience to mentally recreate those elements. If one had never experienced a door slamming, it would be impossible to imagine and mentally recreate the action and sound. Experience is required. The same applies in the music learning process: Listening, audiating, vocalizing, observing, and motor-mimesis will bring the experience, after which they will be synthesized into the CM-image. The second important fact about CMI is that it is the transition between the Virtual and the Motor learning sequences. Although there is no physical movement involved in CMI, students may try to air-perform those actions in order to retrieve what was observed and learned. According to Chriss (2008), this is trial-and-error practice, which is part of the natural learning process: "It means repeating something and making adjustments until one is able to imitate the model effectively or reproduce the mental image" (p. 43). In this pedagogical approach, CMI will add to the idea of mental image, creating an imagery that contains all the prior steps of this pedagogical approach. The CM-image is still a model, but it includes detailed information about each single rhythmic pattern of a given style and a series of associations between sound and action. After

developing the CM-image, some trial-and-error practice will help students make the appropriate adjustments before using the practice strategies of the MLS.

CMI Level 2. CMI Level 2 consists of developing a CM-image with two patterns simultaneously by combining their elements. To develop this second level, it is necessary to have CMI Level 1 fully developed. For example, a student who went through the process of developing CMI Level 1 for the 1st and 2nd surdo patterns of samba can start to audiate them simultaneously, as well as vocalize them (see Figure 4.10).

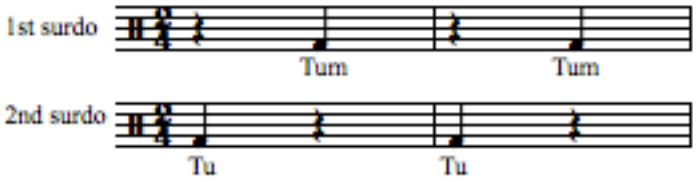


Figure 4.10. 1st and 2nd surdo patterns. Access audio samples

Students would simply set a metronome to a slow tempo and vocalize "Tu" on beat one and "Tum" on beat two. Note that for CMI Level 2, the vocalization step will also be more complex, creating a new vocalization during the process. For example, when developing CMI Level 1, the vocalization step will have the syllables of only one pattern, while during the development of CMI Level 2, students will synthesize syllables of two different patterns into a new vocalization. Figure 4.10 has two different patterns: 1st surdo associated with the syllable "Tum" and 2nd surdo associated with the syllable "Tu". During the development of CMI Level 2, those two, once separate vocalizations, will become one: "Tu-Tum."

Two different directions can be taken to develop the Level 2 CM-image. Those two paths can also be used in the future when developing levels 3 and 4. The first option is to approach this level in the exact same manner as CMI Level 1: listen to both patterns being

played simultaneously, audiate and vocalize them simultaneously with the associated syllables, observe a performer playing both patterns together, use motor-mimesis to create associations between the sound and the motions, and finally synthesize all steps into the Level 2 CM-image. The second path would require more effort from the students and it would follow basically the same steps but omit listening and observing. It will force students to develop their own ideas rather than following what they listened to or observed. If this approach is used, students must fully rely on what was learned during the development of CMI Level 1. The steps then would be to audiate both patterns together based on listening to each pattern separately during CMI Level 1, vocalize both patterns with the associated syllables, and develop the motor-mimesis based on observing each pattern separately during CMI Level 1. Following those three steps, the students must adjust their images to create the Level 2 CM-image and adapt their audiation and motions as necessary. The first approach would simply reuse all the steps and students would listen and observe exactly what has to be done, while the second would skip listening and observing, requiring students to adapt learned materials, develop new ideas, and create a new CM-image. No research basis exists to confirm which would be more effective or lead to a more authentic performance. My experience as an instructor suggests that each student responds differently. Some are able to use the second approach effectively, while others are able to achieve the same results by redoing all the steps. Therefore, it seems best to communicate between instructor and student to define the approach that is most effective and efficient. Regardless of the direction taken, it will result in the development of another CM-image with both patterns together: Imagine the action that creates each sound plus audiate the syllables and/or the actual sound of the drums.

CMI Level 3. CMI Level 3 consists of developing a CM-image with three patterns simultaneously. It is developed in the exact same manner as CMI Level 2, now adding a third pattern. To develop the third level, students are required to have a fully developed Level 2 CM-image and, as a prerequisite, two different patterns fully developed in CMI Level 1. This pedagogical approach is structured as if you were constructing a building: It is not possible to build the third floor without having the second and the first properly structured. For CMI Level 3 the students would add a third pattern, which was previously developed as Level 1 CM-image and integrated into a Level 2 CM-image. For example, a guitar or piano student learning how to play bossa nova would play the groove shown in Figure 4.11.

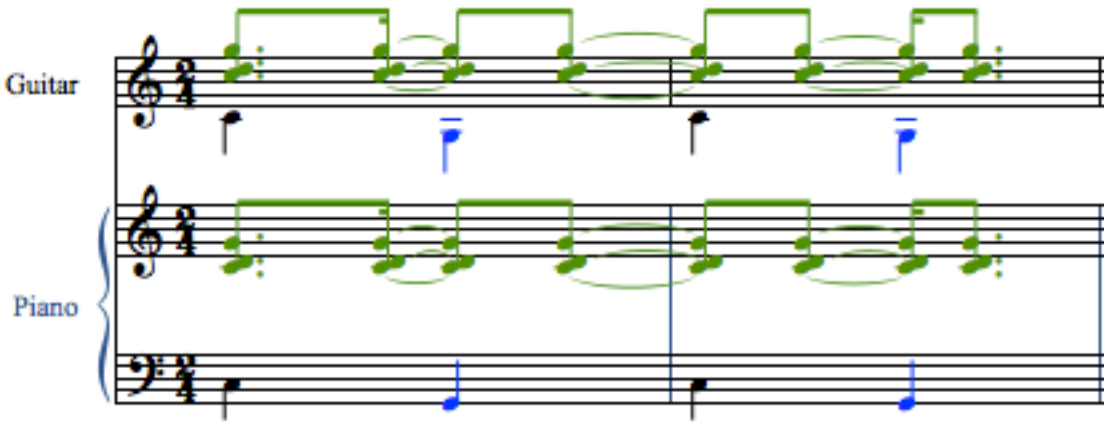


Figure 4.11. Piano and guitar bossa nova groove.

Figure 4.11 presents a common rhythmic accompaniment for bossa nova on guitar and piano, where each color represents a different pattern: blue = 1st surdo, black = 2nd surdo, and green = bossa nova pattern. The steps to reach CMI Level 3 for this groove would be to develop a Level 1 CM-image for each one of the three patterns, develop a Level 2 CM-image with the 1st and 2nd surdo patterns, and finally add the bossa nova pattern.

During the development of CMI Level 3, students should listen to all three patterns simultaneously, then audiate them. When reaching the vocalization step, another synthesis will be necessary. In addition to both surdo patterns, students will vocalize the bossa nova pattern, synthesizing all three into a new vocalization level. When vocalizing these three patterns simultaneously, some syllables would be omitted because they occur at the exact same place in time; in this example, that happens on beat one of the first measure. Therefore, the student will need to choose between vocalizing the 2nd surdo's syllable "Tu" and the first note of the bossa nova pattern, which will be the syllable "Pa". The two options are shown in Figure 4.12.

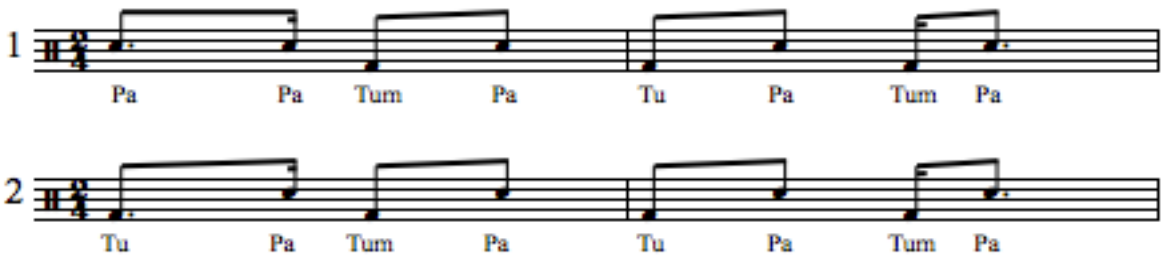


Figure 4.12. Vocalization options for bossa nova groove on piano and guitar.

Access audio samples

It would be best to use the option that best characterizes the style. In this case it is Option 1. In bossa nova, beat one is the weakest: The 2nd surdo note is not as important or stylistically characteristic as the bossa nova pattern, which differentiates this groove from other styles such as samba and choro. All three styles have the first and second surdo patterns, but only the bossa nova has the bossa nova pattern; therefore, the first option would be the one that characterizes bossa nova beyond doubt. But how would students know when and how to make those choices? In the beginning, teachers would need to

guide their students and present the best options for each style. The more students learn about each style, the more they will be able to make the right choices and create their own ideas about each style. Note that this example is fairly simple compared to more advanced bossa nova grooves. Both instructors and students need to keep in mind that variations play an important role in Brazilian popular music styles and, as beginners, students must start with the simplest versions of the main patterns so they will not be overwhelmed with complex patterns in the future.

Another CMI Level 3 example is the bossa nova groove shown in Figure 4.13, which presents one of the many possible grooves of bossa nova on the drum set.

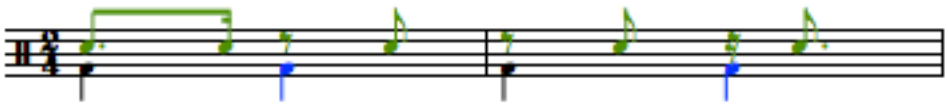


Figure 4.13. Bossa nova on the drum set.

This groove is a combination of three patterns: blue = 1st surdo, black = 2nd surdo, and green = bossa nova pattern. The drummer in this case would need to develop a Level 3 CM-image, vocalizing the entire groove by combining the syllables of each one. In this case the student would use "Tum" for the 1st surdo, "Pa" for the snare drum, and "Tu" for the 2nd surdo, as in Figure 4.14.

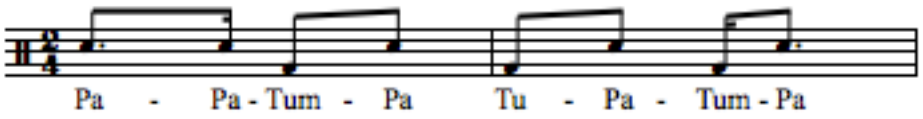


Figure 4.14. Vocalization of drum set bossa nova groove. Access audio samples

This vocalization – along with the prior listening, audiation, and motor-mimesis – generates the Cognitive Motor-Imaging at Level 3. Once students are able to generate a CM-image and vocalize it with the proper inflections and feel, they will already have developed authentic concepts and knowledge about the style; the only remaining component will be to transfer that knowledge to the instrument. As a reminder, although actual physical practice is not integrated into CMI, students are welcome to do trial-and-error practice to verify their progress and make appropriate adjustments. At this stage the trial-and-error practice should happen in the presence of an instructor or more experienced players who would be able to guide the students appropriately, pointing out mistakes that they may not be able to perceive yet.

CMI Level 4. CMI Level 4 incorporates four patterns at the same time; it follows the same steps from CMI Level 3 and adds another pattern. We can use the example from Figure 4.13 and add another pattern to the drum set bossa nova groove (see Figure 4.15). Usually that groove would be played with brushes on the snare drum, with the right hand playing sixteenth notes that depict the shaker pattern while the left hand accentuates the bossa nova pattern.

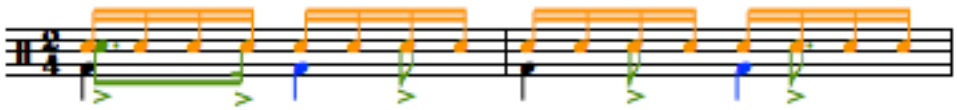


Figure 4.15. Bossa nova with brushes on the drum set.

The patterns in this example are: shaker = orange (right hand brush), bossa nova pattern = green (left hand brush accents), 1st surdo = blue, 2nd surdo = black. Keep in mind that both surdo patterns are played on the bass drum, each with its own inflection.

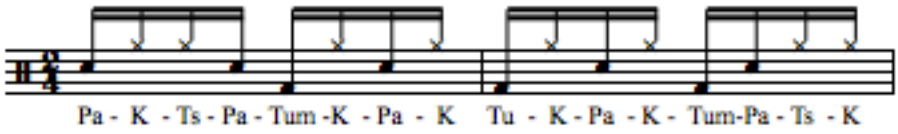


Figure 4.16. Vocalization of drum set bossa nova groove with four patterns.

Access audio samples

With this vocalization, students can develop their Level 4 CM-image for bossa nova.

These CMI levels will serve as a guide for the physical practice during the Motor Learning Sequence. Although it is possible to create a CM-image with five, six, or even more patterns, it would be either impossible for the student to recreate such imageries later or not necessary in an ensemble setting. Moreover, if such combinations could be physically recreated by one person, the patterns would most likely be too compromised, resulting in less authentic grooves. In terms of using CMI in the learning process, the development of different levels will be the same for every student of any instrument; however, students who play percussion, drum set, plucked strings, and other rhythmic instruments will need to develop several CM-images at levels 2, 3, and 4 so that they can develop a variety of authentic grooves. On the other hand, students who play melodic instruments will require just enough to understand the main characteristics of each style and then apply them to their melodic lines. Melodic instrument players will need to learn a minimum of four patterns for each new style learned. Each one of these patterns will generate a Level 1 CM-image. Later, two of those patterns will be combined to create one Level 2, then a third pattern will be added to create one Level 3, and finally the fourth will be added creating one Level 4 CM-image, so that they can develop a strong foundation for the authenticity of the melodies they will be performing. Students who perform on rhythmic instruments

(either harmonic or percussion) will need to develop the same CM-images as melodic instruments plus a few other Level 1 CM-images in order to have a vast vocabulary. Later, such players will develop several combinations of two, three, and sometimes four patterns using the vocabulary. Combinations of two patterns will be developed as Level 2 CM-images, combinations of three patterns as Level 3 CM-images, and combinations of four patterns as Level 4 CM-images. There will be countless options of combinations as the student progresses to higher levels. Some combinations will be effective while some may not be. To determine which ones will work in the style, students would always listen to music so that they can analyze, recognize, and assess which are the most common combinations – again, always remembering that patterns will be varied and those variations are essential for authenticity.

Using cognitive motor-imaging with different instrumentalists. The development of cognitive motor-imaging levels is the same for every instrumentalist: Every student will begin their studies of Brazilian popular music by developing four main patterns for each one of the styles they are learning. Both instructors and students must keep in mind, however, that it is of great importance to work on one style at a time to avoid confusion about the proper inflections. This section will guide the reader through the main patterns and the development of four levels of CMI for the five most popular styles of Brazilian music: samba, bossa nova, choro, baião, and maracatu. It will also address what is required from each instrumentalist to develop authenticity. The first steps are common among all instrumentalists. Rhythmic instrument players will be required to develop more options for each level. Finally, percussionists and drummers will be required to develop a greater variety of options, synthesizing more patterns and creating a variety of combinations.

Samba. The first step in developing the levels of CMI for samba is to listen to several recordings of the style. After going through the audiation, vocalization, observation, and motor-mimesis steps, the students will be ready to develop CMI Level 1. The four main patterns to be developed in samba are shown in Figure 4.17.

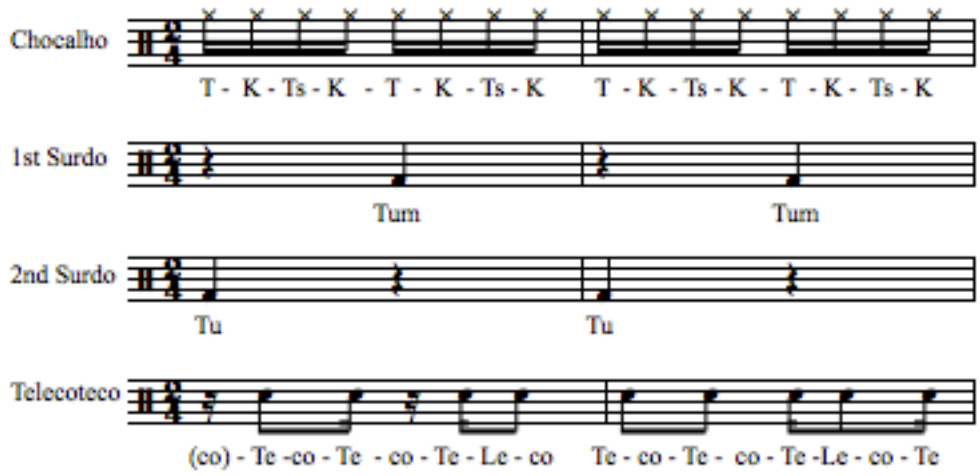


Figure 4.17. Samba main patterns with syllables. Access audio samples

One-by-one, each of the patterns will be developed into Level 1 CM-images, starting with the *chocalho* (shaker) pattern, then the 1st surdo, followed by the 2nd surdo, and finally the telecoteco pattern, which is the most complex among all four patterns. The steps are:

1. Listen to samba tunes.
2. Listen to *chocalho* pattern isolated
3. Listen and recognize *chocalho* pattern in a variety of samba tunes.
4. Audiate *chocalho* pattern.
5. Vocalize *chocalho* pattern.
6. Observe performances and observe how to perform the *chocalho* pattern.
7. Associate vision, action, and sound (motor-mimesis) of the *chocalho* pattern.

8. Synthesize the prior seven steps into CMI Level 1 of the *chocalho* pattern.
9. Engage in trial-and-error practice of the *chocalho* pattern under supervision.

The students should follow all nine steps for the 1st surdo, 2nd surdo, and telecoteco patterns, respectively.

After developing the Level 1 CM-images for all four patterns, students will develop a Level 2 CM-image combining the *chocalho* and the 1st surdo patterns. When listening, be aware of the possibility of variations and that, in several tunes, some patterns may be played by different instruments. For example, the surdo pattern may be played on the drum set's bass drum, floor tom, or other traditional instruments. Additionally, patterns could be varied. Similarly, the *chocalho* pattern may be played by a great variety of shakers, *reco-recos* (traditional instrument similar to a guiro), hi-hat, etc. Regardless of which instrument is playing the pattern, the student needs to be able to recognize it. The instructor will need to guide the student very thoroughly during this step. The more students listen and recognize possibilities, the less involved the instructor should be. From an instructor's perspective, it is important to challenge the students or else they will not become able to develop recognition skills. The steps to develop the Level 2 CM-image with *chocalho* and 1st surdo are:

1. Listen to samba tunes trying to recognize both patterns at the same time.
2. Audiate both patterns simultaneously.
3. Vocalize both patterns simultaneously as shown in Figure 4.18

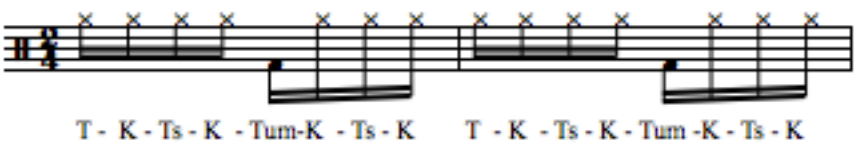


Figure 4.18. Vocalization of *chocalho* and 1st surdo pattern.

Access audio samples

4. Associate vision, action, and sound (motor-mimesis) of both patterns simultaneously.
5. Synthesize the prior four steps into CMI Level 2.
6. Engage in trial-and-error practice of both patterns together.

After developing the Level 2 CM-image with the *chocalho* and 1st surdo patterns, students will develop the Level 3 CM-image by adding the 2nd surdo pattern through the following steps:

1. Listen to samba tunes, trying to recognize all three patterns at the same time.
2. Audiate patterns simultaneously.
3. Vocalize patterns simultaneously as shown in Figure 4.19

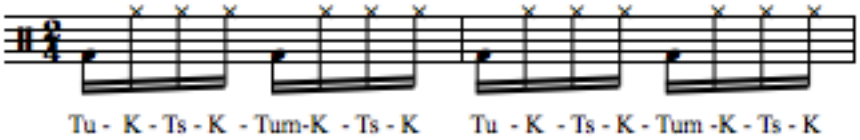


Figure 4.19. Vocalization of *chocalho*, 1st and 2nd surdo patterns.

Access audio samples

4. Associate vision, action and sound (motor-mimesis) of all patterns simultaneously.
5. Synthesize prior four steps into CMI Level 3.
6. Engage in trial-and-error practice patterns together (for rhythmic instruments, percussion and drum set players only).

Finally, to develop the Level 4 CM-image, students will add the telecoteco pattern to the already developed Level 3 CM-image. The steps are the following:

1. Listen to samba tunes, trying to recognize all four patterns at the same time.
2. Audiate patterns simultaneously.

3. Vocalize patterns simultaneously as shown in Figure 4.20.

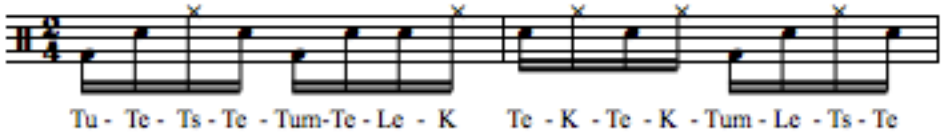


Figure 4.20. Vocalization of *chocalho*, 1st, 2nd surdos, and telecoteco patterns.

Access audio samples

4. Associate vision, action, and sound (motor-mimesis) of all patterns simultaneously.
5. Synthesize the prior four steps into CMI Level 4.
6. Engage in trial-and-error practice patterns together (for percussion and drum set only).

Note that the more patterns you combine, the more compromises need to be made in terms of vocalization of syllables; however, the audiation component need not suffer any loss. Once students reach this level, they will have a strong foundation to start the physical practice on their instruments. Both students and instructors must keep in mind that the patterns presented here to create the samba Level 4 CM-image are a starting point; other patterns may be incorporated and/or substituted to create more variety in the future. The more vocabulary students learn, the better they will speak the language; the more they listen to how this language is spoken, the more they will contextualize the words (patterns) within the language (style).

Bossa Nova. The development of all four levels of CMI for bossa nova will be exactly the same as it is for samba. The first three patterns are also the same and the telecoteco pattern will be substituted with the bossa nova pattern. In terms of character and inflection, most of the bossa nova tunes are more laid back than samba. While samba is a very energetic style, usually at faster tempos (with a large number of exceptions), the bossa nova has a more "chill" character and slower tempos. Keep in mind that the BPM (beats per

minute) on the metronome is not exactly what differentiates these two styles; it is a matter of how the tempo is approached, how the inflections are different, and how the patterns are treated in the determined tempos. This difference will be very clear once students start to listen to bossa nova tunes. They will be able to recognize many patterns studied during the samba section but the character will be different. The patterns for this section are shown in Figure 4.21.

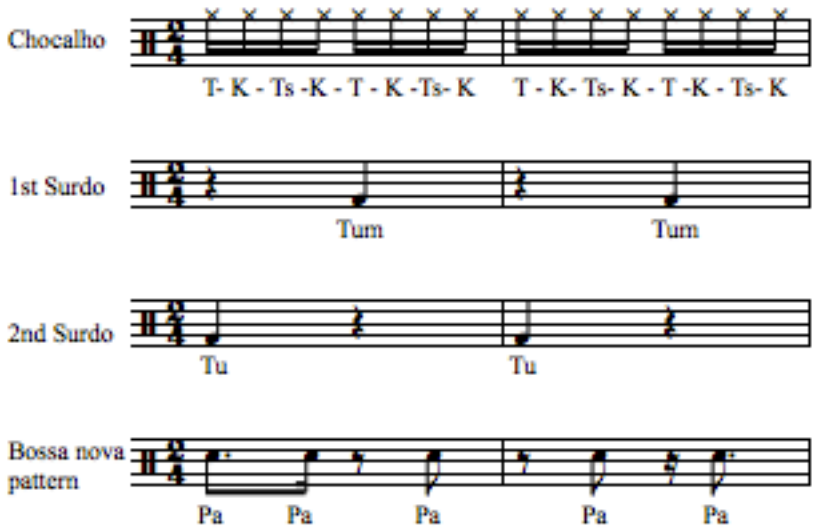
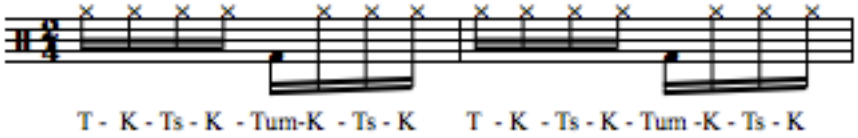


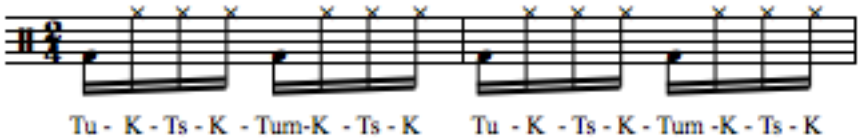
Figure 4.21. Patterns for development of CMI in bossa nova. Access audio samples

Following the same steps presented in the samba section, the students will develop CM-images for levels 1 through 4 using the patterns from Figure 4.21. It is important to start with the *chocalho* pattern followed by 1st surdo, 2nd surdo, and finally the bossa nova pattern. See the vocalization of CMI levels 2, 3 and 4 in Figure 4.22.

CMI Level 2 vocalization



CMI Level 3 vocalization



CMI Level 4 vocalization

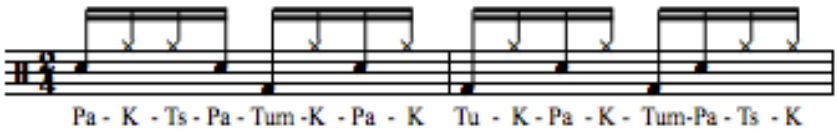


Figure 4.22. CMI vocalization for bossa nova. Access audio samples

To understand the subtle differences between samba and bossa nova, the students are required to listen to bossa nova tunes during the entire process. Once students have both samba and bossa nova styles developed, they should be encouraged to listen to songs of both styles and compare their elements so that they can further understand the differences of inflection and character.

Choro. The VLS procedures should be applied in choro leading to the development of all CMI levels. After listening to choro songs, students will proceed in the same manner. Following the same steps of the prior styles, developing Level 1 CM-images for each single pattern in Figure 4.23.

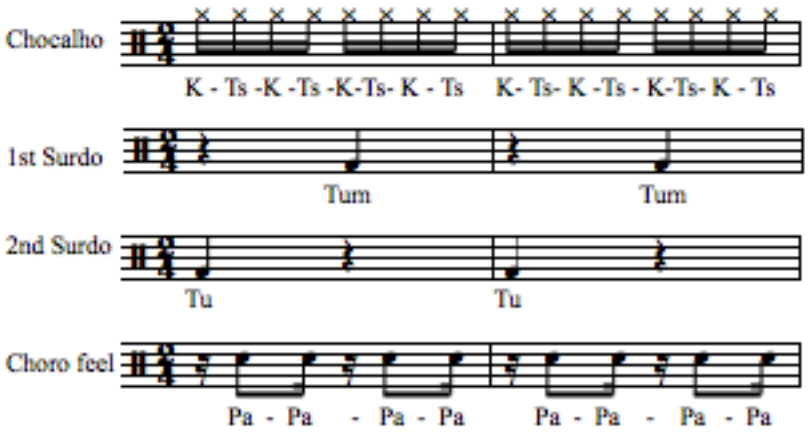


Figure 4.23. Patterns for development of CMI in choro. Access audio samples

The 1st and 2nd surdo patterns are the same in choro as they are in samba and bossa nova. The chocalho pattern, although rhythmically identical to the prior styles, has a different inflection. The syllables are placed in a manner to emphasize the second and the fourth 16th-notes of each beat. The same emphasis is presented in the choro feel pattern, which is not an actual rhythmic pattern present in the style, but it is strongly embedded in the overall feel. Like jazz, where every player emphasizes beats 2 and 4, choro emphasizes the 2nd and 4th sixteenth notes of each beat; therefore, it is an important element to be developed. It also will help students differentiate choro from samba and bossa nova, as well as fully characterize the style. When developing CM-images for the choro feel pattern, the students should carefully listen to the weight put on those notes. To develop the motor-mimesis portion of the CMI in this implied pattern, students can develop an imagery of themselves clapping the choro feel. When using trial-and-error practice, it is important to do so with a metronome, especially in this case when the proper stylistic feel and pattern inflection have more weight on syncopations and upbeats. The vocalization for CMI Level 3 is shown in Figure 4.24.

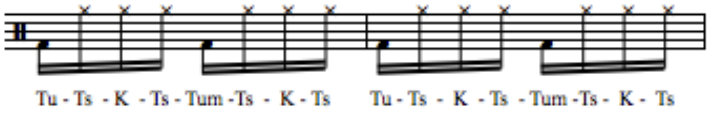


Figure 4.24. Vocalization of CMI Level 3 for choro. Access audio samples

Since the 4th pattern is a reinforcement of the chocalho pattern inflection, the vocalization for CMI Level 4 would substitute the syllable "Ts" for the syllable "Pa" as shown in Figure 4.25. However, the Level 4 CM-image will incorporate both patterns in the mental imagery.

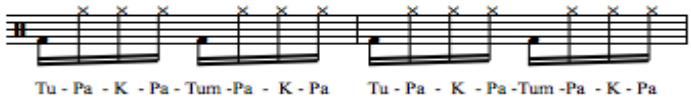


Figure 4.25. Vocalization of CMI Level 4 for choro. Access audio samples

Baião. Baião is originally from northeast Brazil and its setting is usually a trio consisting of zabumba, triangle, and accordion. Through the steps of the Virtual Learning Sequence, students can develop all four levels of CMI using the patterns shown in Figure 4.26.

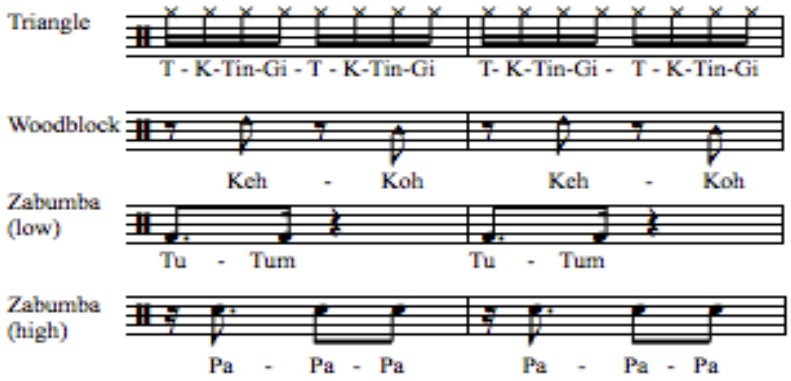
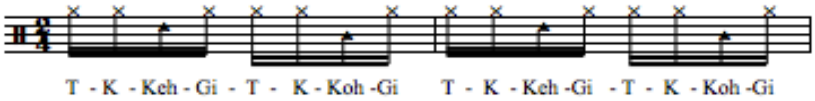


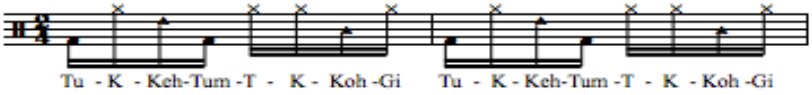
Figure 4.26. Patterns for development of CMI in baião. Access audio samples

After developing the Level 1 CM-image of the baião patterns in the order shown in Figure 4.26, students will develop CMI levels 2, 3, and 4. The four Level 1 CM-images and CMI levels 2, 3 and 4 are meant for all instrumentalists. Figure 4.27 presents the vocalization for the various levels.

Vocalization of CMI Level 2



Vocalization of CMI Level 3



Vocalization of CMI Level 4

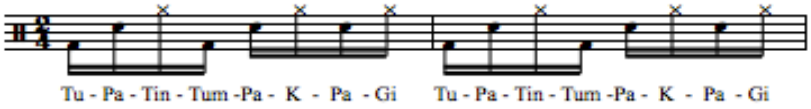


Figure 4.27. Vocalization of CMI levels 2, 3, and 4 of baião. Access audio samples

Note that the vocalization of CMI Level 4 does not include the woodblock pattern. This pattern has a role of emphasizing the upbeats, and such inflection also happens between the triangle and the high zabumba pattern. Therefore, the woodblock pattern is implied in the vocalization. Like in the choro style, both patterns will be present in CMI Level 4, but only one appears in the vocalization. Students who play rhythmic instruments should develop more options, creating a series of combinations. Those combinations will be

developed as additional CM-images in levels 2, 3, and 4, depending on how many patterns are used.

Maracatu. The procedures for maracatu are the same as the previous styles. The patterns for CMI development are shown in Figure 4.28 and Figure 4.29.

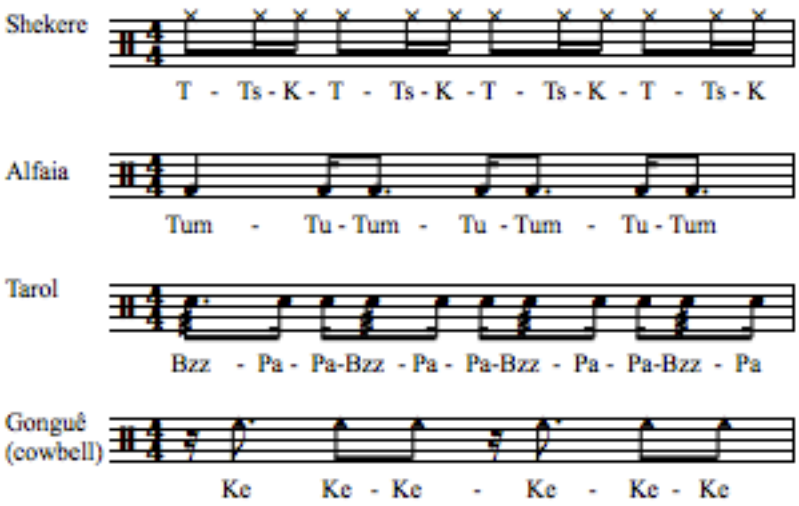
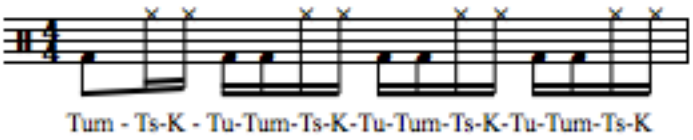


Figure 4.28. Patterns for development of CMI in maracatu. Access audio samples

Maracatu CMI Level 2 vocalization



Maracatu CMI Level 3 vocalization

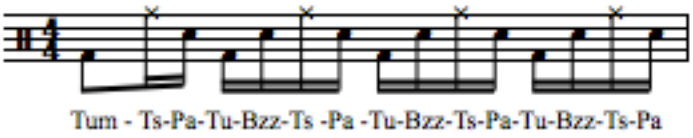


Figure 4.29. Maracatu vocalization for CMI levels 2 and 3. Access audio samples

For the vocalization of the Level 4 CM-image, we will have an exception to the general rules. The syllable system will not help the vocalization and the development of CMI Level 4 for maracatu; moreover, it would make the learning process more difficult and the results would be far less effective. If we were to follow the syllables presented, we would have the vocalization shown in Figure 4.30.

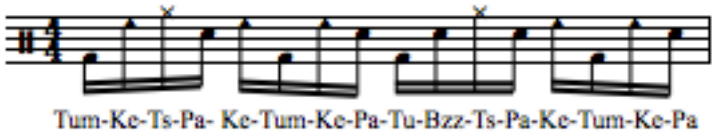


Figure 4.30. Potential maracatu vocalization for CMI Level 4.

However, the vocalization in Figure 4.30 will go against the characteristics of the style, making it too busy, too complex to vocalize, and ineffective for audiation. All patterns are partially present, but too compromised to be meaningful. For that reason it is important to keep the overall rhythmic skeleton that most characterizes the maracatu, as shown in Figure 4.31.

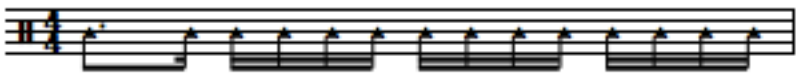


Figure 4.31. Rhythmic skeleton of maracatu.

Having a dotted eighth-note on the downbeat will provide for more authentic audiation and vocalization, rather than trying to squeeze all the syllables for all patterns as shown in Figure 4.30. Still, the audiation and the Level 4 CM-image will contain all four patterns, including the gonguê pattern that was left out of the vocalization. Note that CMI levels 2 and 3 start with an eighth-note, creating a break and preventing having sixteenth notes on

all beats of the measure. That break is extremely important for the authenticity of this style. Lastly, the syllables used to vocalize the Level 4 CM-image of maracatu will be different than the syllables we used so far. We will use the syllables from the name of the style – Ma-Ra-Ca-Tu – the new syllables and vocalization can be seen in Figure 4.32.

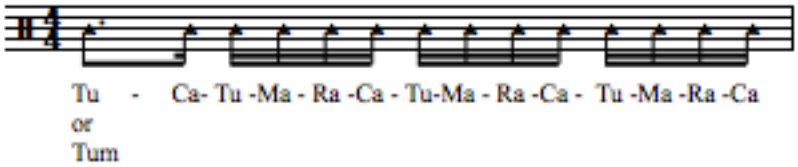


Figure 4.32. Vocalization of CMI Level 4 of Maracatu. Access audio samples

Both syllables "Tu" and "Tum" can be used on the downbeat, but "Tum" is recommended since it is supposed to be performed longer and with more weight than beats two, three, and four.

CMI involves the development of the mental imageries that will be practiced. Each style will have its own vocabulary of rhythmic patterns, which will generate its own set of CM-images in four different levels, allowing students to have a clear objective during their practice sessions. Each style approached in this dissertation has countless rhythmic patterns and pattern variations that may be combined, creating different grooves for each instrument. Each combination will generate a new CM-image that has to be developed prior to any practice session. After the development of a CM-image, students will mentally practice it before the actual physical practice.

Mental Practice

Mental practice is an important step in the learning process; it will introduce the development of motor skills and be part of the MLS. This step functions as a bridge between the VLS and the MLS. Note that students do not actually play anything at this

point; however, they should have a very clear idea about how to do so. Musicians may overlook the importance of mental practice, but "as a supplement to normal physical practicing, mental practicing can help us improve much more quickly" (Gebrian, 2015, p. 33). Research shows that, when developing motor skills, the portion of the motor cortex that controls that activity becomes larger. The same research tested two groups and found "that this area of the motor cortex got larger in the mental practice group as well" (Gebrian, 2015, p. 33). Mental practice has many benefits for the development of efficient and consistent motor skills to perform Brazilian popular music styles. Additionally, it can reduce the time spent in actual physical practice. The results of research conducted by Alvaro Pascual-Leone and his colleagues at the National Institute of Health demonstrate how mental practice can develop skills almost to the same level as actual physical practice. Two groups were tested and according to Gebrian (2015):

> … after five days, the group that only practiced mentally could play it at the same level as the physical practice group achieved after three days. The mental practice group was then allowed to practice at the keyboard for two hours, after which they could play it perfectly. (p. 32)

At this point of the learning process, students will be encouraged to mentally practice the CM-images they have developed. They will be mentally practicing the motions they learned by observing others play (motor-mimesis) while audiating and vocalizing the appropriate syllables associated with each pattern. Note that mental practice is not the same as developing CM-images. Practice (either mental or physical) implies repetition of a procedure with intent to improve. During CMI students develop and create imageries to be practiced. Once the CM-images are created, they will be practiced (repeated until improved), mentally and then physically. During the mental practice step, students may

start to try some actual physical movements, as if they were air-playing their instrument; however, an instructor should oversee them in order to assure they are using the proper motions. According to Gebrian (2015):

> Listening, singing, and moving, as well as just thinking about our music away from our instruments will lead to improvement. Once we do actually play what we have practiced mentally, it will take far less time to get it to the desired level than if they had only practiced physically. (p. 33)

While mentally practicing and air-playing some of the motions, students could verify their technique from any video samples they were instructed to watch in order to learn those motions in the first place. It is important to note that developing the CM-image and mentally practicing the motions will not make the motor skill practice completely mistake-free, but it will significantly reduce the time spent on it.

In this pedagogical approach, the mental practice portion is divided into two steps: mental practice of the CM-image and mental practice of the CM-image with the addition of physical action. Both steps will happen in parallel so that the instructor and the student can make sure the practice is successful.

Step 1: Mental practice of the CM-image. The student will start by practicing a pre-selected CM-image. It will happen internally: in the student's brain without making any sound or motion. Students will imagine themselves performing the CM-image, repeating it until they can clearly audiate and mentally see every motion incorporated in that CM-image. In like manner to physical practice, mental practice involves repetition until one is able to reproduce motions and sounds. Therefore, students will spend a few minutes imagining themselves playing while simultaneously audiating the musical pattern.

Step 2: Mental practice of CM-image plus physical action. After a few tries of step one, students can start vocalizing and physically reproducing the motions associated with the CM-image they are practicing. The air-playing will help instructors and students verify their initial performing skills. Once more, a few repetitions and adjustments will be necessary until they become able to perfectly reproduce the CM-image.

Students will need to go back and forth between both steps until they achieve the desired result. Besides developing authentic performances, this approach will allow students to become their own teachers since they will create strong mental imageries of what needs to be achieved. Students will need to compare what they mentally see and audiate to what they actually do when they add the physical action. In a manner of speaking, students become self-taught, which is another informal way to acquire skills and knowledge widely used by native Brazilians who are learning to perform their music. The mental practice and its steps function as a bridge into the MLS, when students will keep following the mental practice steps. The only difference will be that they will actually be performing on their instrument and encouraged to sing along with the syllables unless they perform wind instruments; in that case, the vocalization will not be possible for obvious reasons.

Summary of the VLS

During the VLS, students are exposed to authentic music, creating a strong background. Each element of the sequence is synthesized, serving as a foundation to the MLS and the actual physical development of technical skills. Note that the VLS does not require students to play anything. It is meant to teach authenticity through listening, audiating, and vocalizing, and then developing associations between sounds and actions through observing and motor-mimesis. All these elements are synthesized, generating a

series of CM-images that serve as the foundation to mental practice and the actual motor skill development. Figure 4.33 shows the VLS step-by-step.

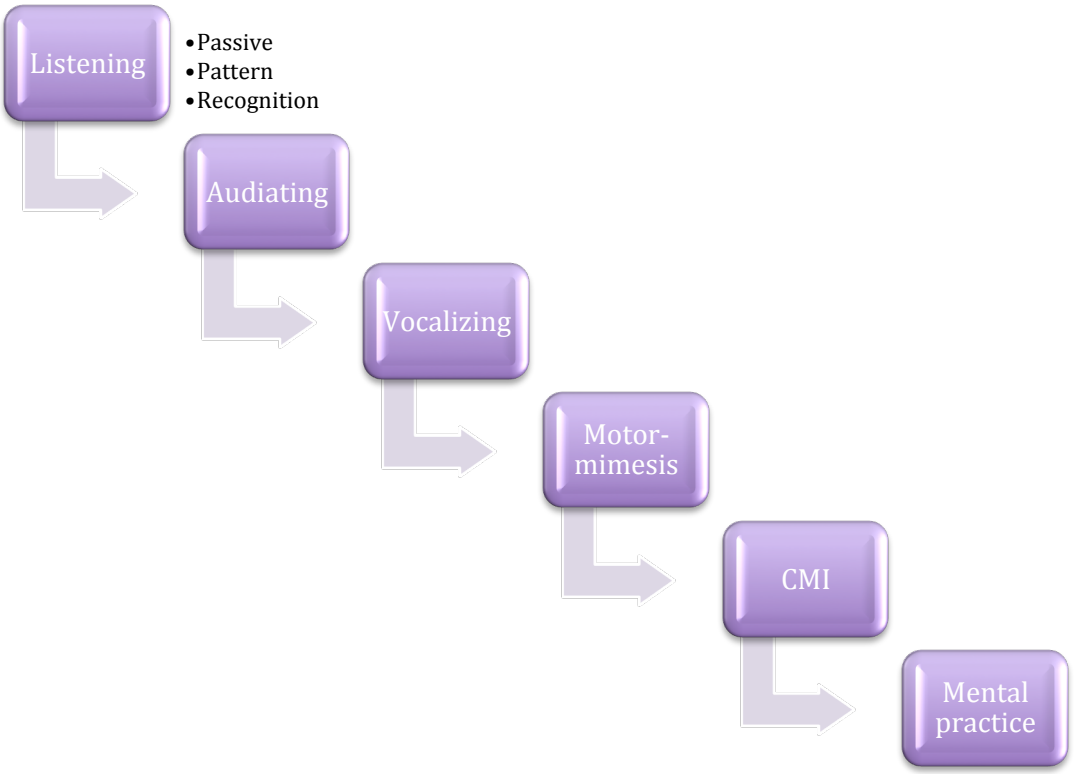


Figure 4.33. VLS step-by-step.

After thoroughly developing each step of the VLS, the actual motor skills will be developed. Once the CM-images are developed and mentally practiced, students will use the steps of the MLS to determine the most appropriate sequence of patterns for physical practice and preferred strategies to be used during the practice sessions.

Motor Learning Sequence

The Motor Learning Sequence (MLS) is divided into two main categories: *motor skill development* – addressing how to organize musical patterns and technical elements in a sequence – and *practice strategies* – addressing how to organize practice sections in an effective manner. The MLS will bring to life the CM-images developed during the VLS. After mentally practicing the CM-images, students will start developing physical motor skills via a gradual sequence of practicing patterns from each style. During the motor skill development process, students will learn how to define the sequence in which the patterns should be practiced and how to start the process of combining patterns to create grooves. Each style will have its own progression, created based on the rhythmic structure of each pattern and related psychomotor factors. After defining the sequence in which patterns will be practiced, students will apply research-based practice strategies to maximize effectiveness and efficiency.

Motor Skill Development

Performing Brazilian popular music styles demands high levels of motor skills for all performers, although each instrument will require different levels of motor development. For example, a drummer who is learning to perform samba may encounter or create grooves containing four different patterns played simultaneously, while a flutist would play a single melody or sometimes an accompaniment line that combines two different patterns. Whichever the case may be, there is a high probability that one performer will at some point perform two or more patterns simultaneously, synthesizing the functions of two or more performers from the original samba setting. Similar applications are encountered in many other Brazilian popular music styles. Developing motor skills is, perhaps, the most time-consuming task in performers' lives; however, this demanding process can be eased

by utilizing appropriate learning sequences. In many cases, and especially in Brazilian popular music styles, it is important to practice each pattern separately before combining them; "when too much information is presented at once, our short-term memory becomes overwhelmed and unable to process it" (Luckner, 1990, p. 101). Many types of information are embedded in each pattern. Some types are very obvious, such as the variety of rhythms and pitches. Others, such as inflection and context, may not be as clear and may be overlooked because of the demanding motor skills or because students are not yet familiar with the style and its characteristics. Therefore, each single pattern must be studied and practiced separately. After learning each pattern in isolation, the task of combining them becomes easier and less time-consuming. According to Gagné (1985), a complete skill is a combination of several parts of information contained in that skill and "procedures to be executed in a particular order are often considered to require the learning of behavioral chains" (p. 211). Given that the desired complex motor skill is to perform a particular Brazilian music style, the small procedures will include each one of the rhythmic patterns present in the style. Thus, the MLS is designed to improve the effectiveness and efficiency of developing complex motor skills.

Rhythmic groupings. Rhythms are foundational to most Brazilian popular music styles. Each style includes a unique set of patterns (vocabulary) with different levels of difficulty. Each pattern in the vocabulary can be categorized according to its level of difficulty, which is determined by its rhythmic construction. The first step in defining the sequence in which patterns will be practiced is to use Gordon's metrical hierarchy: macrobeats, microbeats, rhythmic patterns, divisions, and elongations. As Gordon (2012) writes:

- Whichever beats you feel to be the longest are called *macrobeats*.
- *Microbeats* are shorter than macrobeats and are derived from the equal division of macrobeats.
- A *rhythmic pattern* in usual meter is not shorter than one underlying macrobeat (which may include two or three underlying microbeats) and is no longer than two underlying macrobeats
- *Division patterns* may include one or more divisions of macrobeats, other than microbeats, or one or more divisions of microbeats
- *Elongation patterns* may include one or more elongations of microbeats, other than macrobeats, or one or more elongations of macrobeats. (pp. 175, 177, 203)

Figure 4.34 shows examples of Gordon's categories.

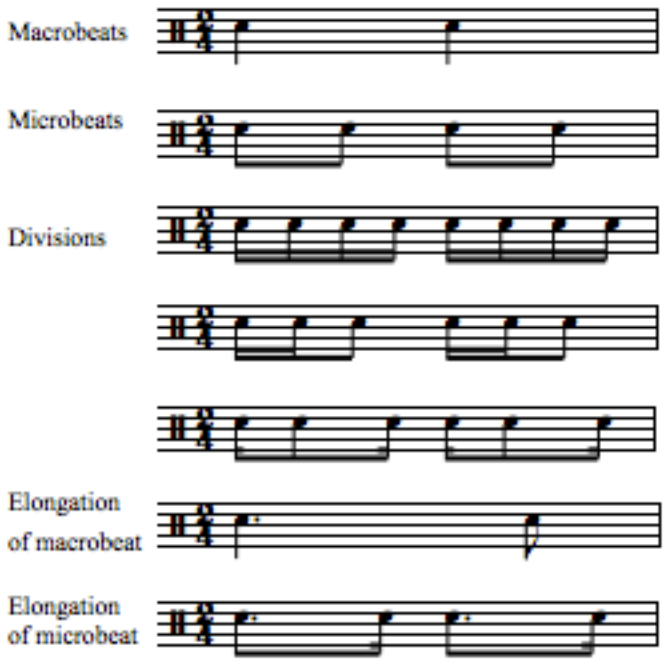


Figure 4.34. Examples of Gordon's definitions of types of beats.

Each pattern from the vocabulary of each style can be analyzed and placed into one of these categories. After categorizing the patterns, students will sequence the patterns starting with those that fit in the macrobeat category, followed by patterns in the microbeat category, then divisions, then elongations, and finally rhythmic patterns. After sequencing the patterns according to this metrical hierarchy, students will take the next step and consider the implications of brain function in motor skill development.

Psychomotor foundations. The brain is divided into two hemispheres; motor regions of each hemisphere control the opposite side of the body. Witelson (1985) found that:

> Functional specialization of cerebral hemispheres in the mediation of cognition in humans has been known for over a century…. Only recently, however, has some quantitative study been made of gross anatomical and histological asymmetry, and has the anatomical asymmetry been suggested to be a substrate of functional asymmetry. (p. 665)

This asymmetry accounts for a person being right- or left-handed, which typically results in one side functioning better than the other in terms of executing particular movements. This fact is especially important when students start to combine several patterns together to create grooves. Some instruments such as drum set, percussion set-ups, percussion keyboards, piano, harp, and others may demand the use of three or even four limbs simultaneously; consequently, performers will be using motor regions of both hemispheres at the same time. Awareness of this will help determine the most effective approach to sequencing and synthesizing patterns into complex motor skills, resulting in the most efficient use of the available practice time.

Applications to Motor Skill Development. Based on Gordon's metrical hierarchy, students will have an initial sequence defined as follows: patterns in the macrobeat category, followed by patterns in the microbeat category, then divisions, then elongations, and finally rhythmic patterns. Some patterns from each style, however, will consist of a combination of two different categories or be longer than what Gordon considers a rhythmic pattern. I labeled these *complex patterns.* The maracatu patterns in Figure 4.35 are examples of complex patterns.

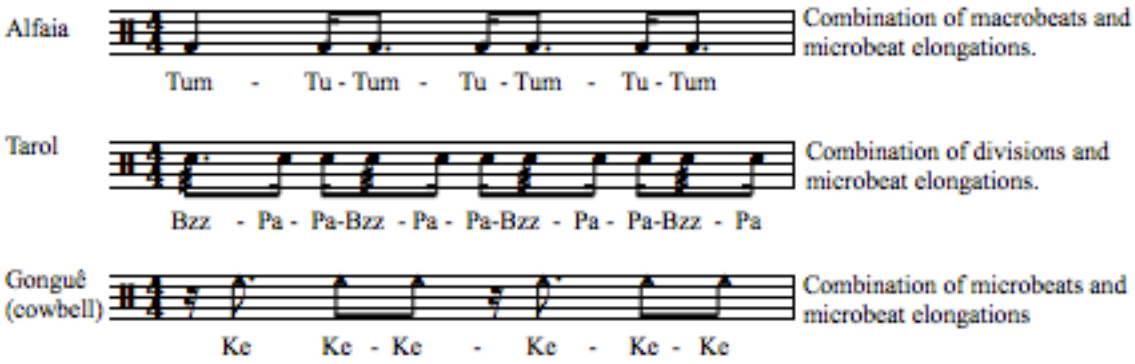


Figure 4.35. Complex patterns of maracatu.

Once the initial sequencing is determined based on the metrical hierarchy, psychomotor factors should be considered. Depending on the instrument the student is learning, however, different approaches will be required. For Brazilian popular music styles, three distinct categories can be identified: Rhythmic Instruments, Drum Set and Percussion Set-ups, and Melodic Instruments.

Within the Rhythmic Instruments' category, the most common instruments in Brazilian styles are piano, guitar (acoustic or electric), cavaquinho, bandolim, double bass, and electric bass. Other less common instruments in this category may include harp,

marimba, vibraphone, and others. These are unusual and non-authentic instruments in Brazilian popular music settings; however, they can be found in recordings and school ensembles.

The Drum Set and Percussion Set-ups category may include not only the standard drum set but also, as commonly used in Brazil, the drum set with additions of Brazilian traditional instruments such as tamborim, agogo bells, pandeiros, jam blocks, and woodblocks. Percussion set-ups usually consist of traditional instruments used in the original setting of the style, but in this case one performer would perform on two or more instruments simultaneously, assuming multiple roles. It is common for such set-ups to include multiple surdos, shakers, pandeiros, cuícas, and drum-set bass drum.

The third category is Melodic Instruments. In this category, the most common instruments in Brazilian traditional settings are flute, clarinet, saxophone, trumpet, and trombone; however, any other melodic instrument such as strings, other woodwinds, and brass instruments fit in this category as well. Melodic instruments can assume two different roles. The primary role, of course, is to play melodies. The secondary role is to play accompaniment lines, which many times are created based on two or more rhythmic patterns. In such cases they will have to follow the appropriate procedures to learn how to play those lines in an authentic manner.

Each of the three categories of instruments will require different approaches during the motor skill development. Additionally, instruments within the same category may also require adjustments adapting the approach to each situation. The following pages will present detailed information about the categories of instruments, examples of instruments within each category, and how to develop and apply the sequence in different instrument.

Rhythmic instruments. Figure 4.36 presents a bossa nova groove played on guitar and piano. The first step is to define the sequence in which the patterns will be practiced. Students and instructors should start defining the sequence by categorizing each pattern according to the metrical hierarchy. This particular groove contains three patterns adapted to piano and guitar: blue = 1st surdo, black = 2nd surdo, and green = bossa nova pattern. Both surdo patterns fit in the macrobeat category. The 1st surdo pattern is a quarter note rest on beat 1 and quarter note on beat 2, while the 2nd surdo pattern is the reverse of that. The bossa nova pattern is a four-beat complex pattern composed of microbeats (eighth notes) and elongations (ties and dotted-eighth notes). After sequencing them this way, students should consider psychomotor factors to determine which limb plays which pattern. On piano both surdo patterns are in the left hand, while the bossa nova is in the right hand. On guitar, the student will need both hands on all patterns. Clearly, a slightly different approach is required depending on which instrument the student plays.

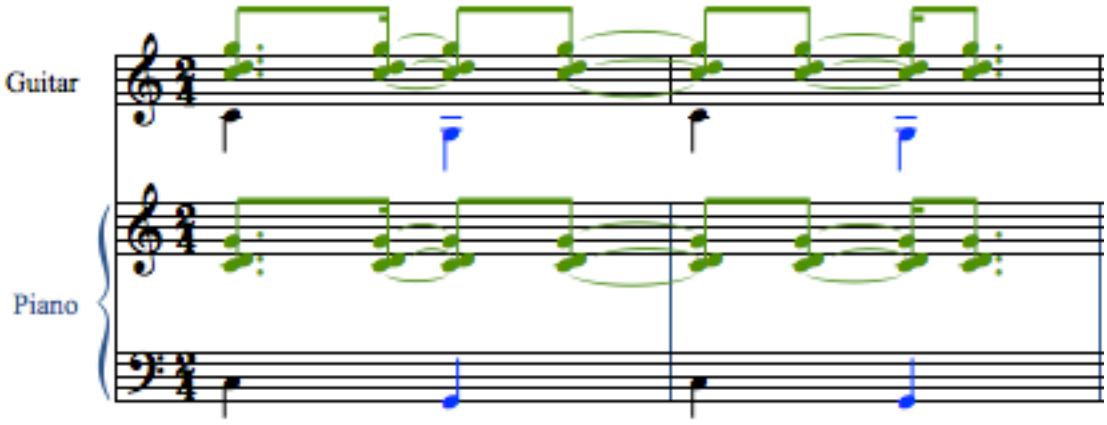


Figure 4.36. Bossa nova groove on guitar and piano.

Before analyzing each instrument separately, it is necessary to understand the general approach to developing the motor skills. First, students will determine the sequence in

which the patterns will be practiced, then follow the cycle shown in Figure 4.37. Note that they will be using the entire pedagogical approach as a cycle that repeats each time a new motor skill is developed. For example, each of the three patterns composing the bossa nova groove shown in Figure 4.36 is learned through a cycle that involves the entire sequence of steps from the VLS to the MLS.

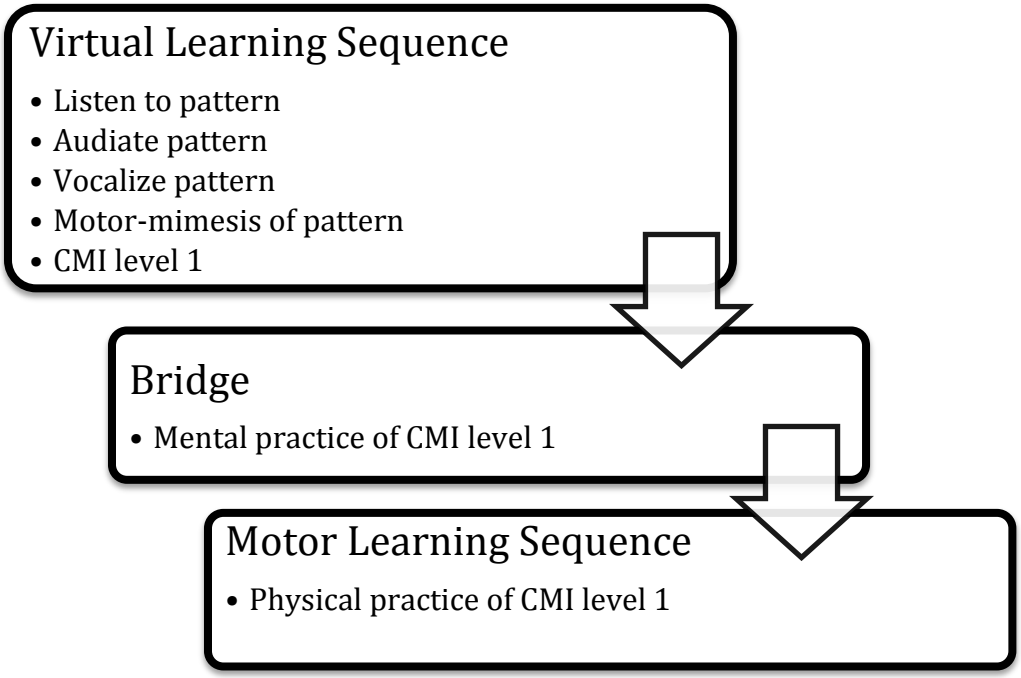
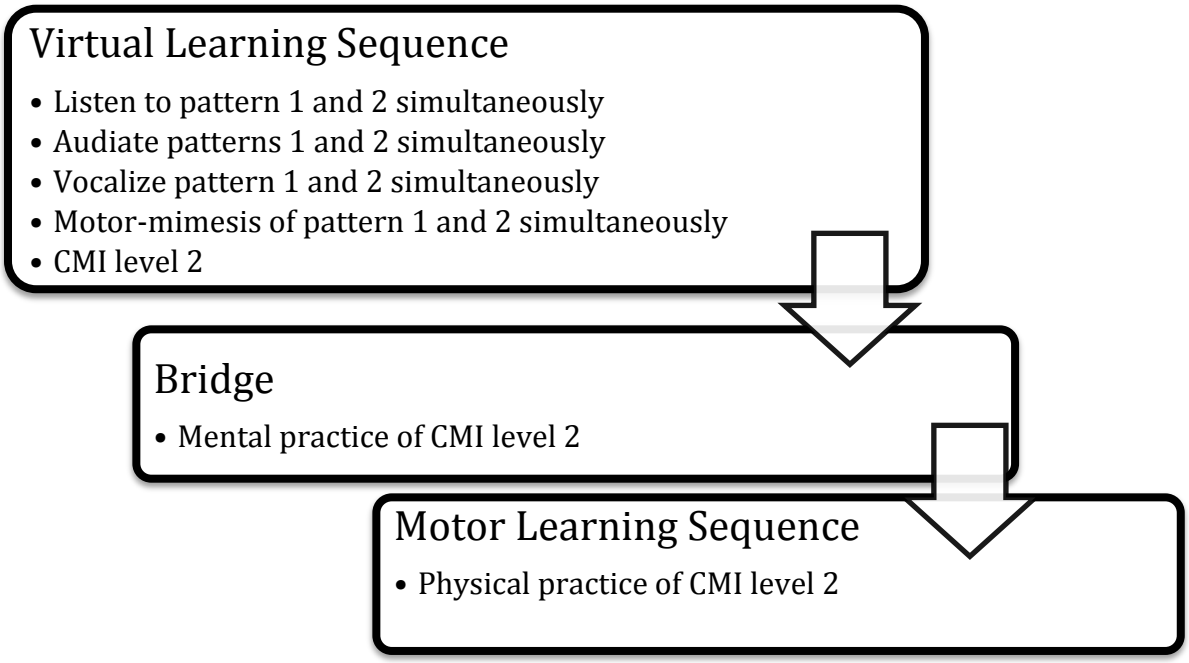


Figure 4.37. Pattern development cycle.

In this particular case, the sequence is 2nd surdo, 1st surdo, and bossa nova pattern. After going through this cycle three times – once for each pattern present in the groove – the student will use the same cycle to combine patterns. The combination process also follows the sequence of patterns defined previously. Therefore, students will combine both surdos first, and then add the bossa nova pattern. Figure 4.38 shows the use of cycles to combine patterns.

1st combination cycle



2nd combination cycle

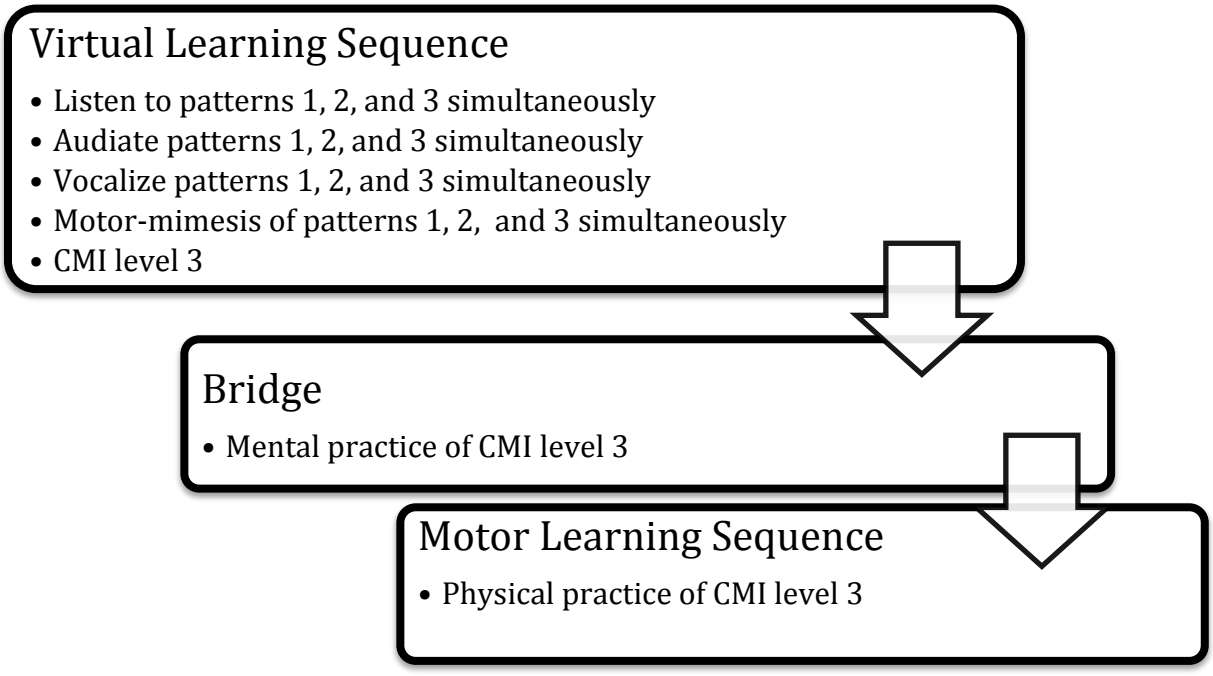


Figure 4.38. Combination cycles.

For this particular groove, there are three patterns: therefore, three cycles for single patterns plus two cycles for the combinations. Other grooves may include more or less patterns and the number of cycles will be adjusted correspondingly. If the groove has two patterns, there will be one cycle for each pattern in isolation and one combination cycle, totaling three cycles. If a groove contains four patterns, there will be seven cycles: one for each pattern alone, one cycle combining two patterns, one cycle combining three patterns, and one cycle combining all four patterns.

The sequencing of patterns, the pattern development cycle, and the combination cycle can be used with every instrument. With that in mind, the bossa nova groove from Figure 4.36 will be developed similarly on both guitar and piano. On guitar, regardless of a student being right- or left-handed, the steps will be the same since the instrument is adaptable to those different types of people. Therefore, a guitar student would learn the 2nd surdo pattern first, with the right hand only (strumming hand, remember to reverse hands in all steps if the student is left-handed playing a left-handed guitar). Note that on guitar, the right hand is producing the rhythm, while the left hand is producing the different pitches. By playing the strumming hand only, students will be practicing the rhythm of the pattern alone (right hand) and not adding the pitches (left hand) from the score. Whenever a student is using only the strumming hand, they will be playing what is called *open string.* On guitar the open strings are traditionally set on the following pitches: E3, A3, D4, G4, B4, and E5. Therefore, this pattern is played with the thumb on the open-string A. Some instruments (like guitar) require both hands to play a single pattern; in such cases, some adaptations in the cycle sequence may be necessary in order to practice each hand separately. The integrity of the patterns will not be affected when separating hands in this case. The only difference is that, by learning one hand at a time, the actual pitches will be

different or there will be no strumming. The following steps exemplify the procedures to learn the bossa nova groove on guitar:

1. Pattern development cycle 1st time: During the 1st cycle the motor-mimesis step will develop associations between the 2nd surdo pattern and the right-hand thumb. No use of the left hand yet; therefore, during the actual physical practice the student will play on the open-string A.
2. Pattern development cycle 2nd time: Repeat step 1 to develop the 1st surdo pattern, which is played with the same thumb on the E string. Remember it has a different inflection than the 2nd surdo; it has a subtle weight, making it slightly stronger.
3. Pattern development cycle 3rd time: Still with the right hand, develop the bossa nova pattern using the appropriate fingers (index, middle, ring fingers). Do not use the left hand yet. Play the pattern on the G, B, and high E open strings.
4. 1st combination cycle: Combine both adapted surdo patterns and play with a metronome. This is an easier task on the guitar since they are both played with the same hand.
5. 2nd combination cycle: Combine all three patterns on the right hand with open strings.
6. 2nd combination cycle 2nd time: Develop the left hand alone. Place the left-hand fingers on the notes shown in the chord in Figure 4.36. Practice the change made by the index finger moving from C to G with the use of a metronome.
7. 2nd combination cycle 3rd time: Combine both hands.

Remember that for each cycle, students are redoing all the steps from the VLS; this involves enough repetitions to solidify the authenticity and motor skills of each pattern.

On piano, the procedures to develop motor skills for the same groove will be similar. The sequence of patterns will be the same, but psychomotor factors will not play a considerable role in this case. Piano students will learn and adapt the 2nd surdo pattern first even though it is played by the left hand. The fact that both surdo patterns together are much simpler than the bossa nova pattern will allow students to learn those first, even if the nondominant hand plays them. Therefore, the steps will be the following:

1. Pattern development cycle 1st time: 2nd surdo pattern (black notes in Figure 4.36) played with left-hand Finger 1 (thumb).
2. Pattern development cycle 2nd time: 1st surdo pattern (blue notes in Figure 4.36) played with left-hand Finger 4.
3. Pattern development cycle 3rd time: Bossa nova pattern played with the right hand.
4. 1st combination cycle: Combine both surdo patterns.
5. 2nd combination cycle: Combine both hands creating the full groove (Note: for this particular groove there is no use of pedal).

Note two important situations that may occur with piano players. First, for the groove development presented, the psychomotor factors were not considered because it happens that the simpler patterns are on the nondominant hand (assuming right-handed players). However, there are cases that both hands play the exact same rhythmic pattern but with different pitches or chords. In such situations the psychomotor factors will be considered and the student would develop the right hand first. Other situations may arise when the patterns in each hand are from the same category of the metrical hierarchy. In those cases it is also necessary to consider the psychomotor factors after determining the sequence of patterns through the metrical hierarchy. Consider a left-handed pianist developing the

bossa nova groove in Figure 4.36. In this case, the metric hierarchy will interact with the psychomotor factors and the pianist would practice the patterns in the sequence defined, but it would be the dominant hand since the player is left-handed.

When developing motor skills for any other groove or style, students who play rhythmic instruments will follow the same steps. First, define the sequence in which patterns will be practiced. Second, practice each pattern using the development cycle. Lastly, combine patterns using the combination cycles. Keep in mind that the number of cycles will change depending on how many patterns are present within a single groove and that adaptations may be required depending on how psychomotor factors can be applied to each particular instrument. The foundational rule: A single pattern should not be broken under any circumstances. Patterns should always be learned in their entirety; otherwise, the rhythmic syntax and authenticity will be lost. Notice that during the development of the bossa nova groove on guitar, the student focused on each hand separately. The patterns themselves were not broken or divided; they were simply performed on different pitches during the first few steps.

Another common situation encountered on rhythmic instruments is performing the melody and an accompaniment simultaneously. A pianist that encounters this will typically use the left hand to play the rhythmic accompaniment – which sometimes is a combination of two or three patterns – while the right hand plays the melody simultaneously. In such cases the students can approach the melody as if it were a complex pattern: placed at the end of the sequence and also practiced separately. After learning each pattern and the melody separately, students would combine them following the predetermined sequence. Similar situations can arise in many other rhythmic instruments such as guitar, vibraphone, and harp. Instructors and students will have to make an assessment about which would be

the most appropriate sequence of development according to each situation. The general guideline is to define the sequence of patterns according to the metrical hierarchy and psychomotor factors, which vary according to each instrument's necessity. With that in mind, remember to always keep the rhythmic patterns intact even if it means using both hands at the same time.

Drum set and percussion set-ups. The approach to motor skill development on drum set and percussion set-ups will require a more careful approach since performers will likely be using all four limbs. Therefore, psychomotor factors will play a particularly important role. Figure 4.39 shows a drum set groove composed of four patterns adapted from the original *bateria de samba* (samba percussion ensemble).

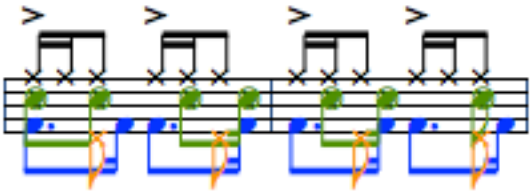


Figure 4.39. Samba groove on drum set.

The patterns in this groove are: blue = 3rd surdo, black = adaptation of repinique pattern, orange = adaptation of the chocalho pattern, and green = adaptation of caixa pattern. To build this groove, students will consider metrical hierarchies and sequence the patterns accordingly. These patterns fit in the following categories: 3rd surdo = divisions and microbeat elongations; chocalho = microbeats; repinique = divisions; caixa = complex pattern. The most effective sequence for practice, therefore, is chocalho, repinique, 3rd surdo, and caixa. After organizing the patterns accordingly, students need to consider the psychomotor factors. For example, the 3rd surdo pattern is played on the bass drum with the right foot, the repinique pattern is played on the ride cymbal with the right hand, the

caixa pattern is played with the left hand on the snare drum, and the chocalho pattern with the left foot on the hi-hat. Isolating the patterns according to which side of the body plays each of them, the surdo and repinique patterns are on the right, while the caixa and chocalho are on the left. After accounting for metrical hierarchy and psychomotor factors, the student will overlap both parameters to determine a sequence that is gradually increasing in difficulty. In some situations there will be more than one possible option, depending on the level of difficulty of each pattern in each limb. In this particular example, there are a few options for sequencing. Based on my experience as a drum set instructor, I would recommend that a right-handed student practice each pattern played with the right-side limbs first, followed by each pattern played with the left side. Considering both metrical hierarchy and psychomotor factors, the sequence would be: repinique (divisions, right hand), 3rd surdo (elongations and divisions, right foot), chocalho (microbeat, left foot), and caixa (complex pattern, left hand). Since the drum set is adaptable for left-handers, the student could switch right for left. The steps for a drum set student will be as follows:

1-4. Use cycle 1 for each single pattern separately following the defined sequence.

5. Use combining cycle to combine repinique and 3rd surdo (right limbs)
6. Use combining cycle to combine chocalho and caixa (left limbs).
7. Use combining cycle to combine repinique and caixa (hands).
8. Use combining cycle to combine surdo and chocalho (feet).
9. Use combining cycle to combine repinique and chocalho.
10. Use combining cycle to combine surdo and caixa.
11. Use combining cycle to combine repinique, surdo, and chocalho.
12. Use combining cycle to combine repinique, surdo, and caixa.
13. Use combining cycle to combine chocalho, caixa, and repinique

14. Use combining cycle to combine chocalho, caixa, and surdo.

15. Use combining cycle to combine all four patterns.

Although this groove is a combination of four patterns, the student will use more than seven cycles. In this case, as students start combining patterns, they will not simply be adding the next pattern in the sequence; rather, they should go through every possible combination of two patterns, three patterns, and finally combining all four. Therefore, they will need to use one cycle for each single pattern, six cycles combining two patterns, four cycles combining three patterns, and lastly, one cycle with all four patterns. This results in a total of fifteen cycles. These steps develop every possible combination among the original four patterns. By applying the cycle to every single pattern and every possible combination, students will develop a consistent sense of authenticity and motor skills while each step will gradually increase in difficulty.

Once students develop a consistent vocabulary and use it to create different combinations and grooves, they can use a condensed approach, which will also help with solidifying their skill set. This condensed approach prioritizes the development of motor skills and substitutes the combination cycles with an approach with fewer steps. It uses only audiation, vocalization, and CMI. If a student already has an authentic vocabulary and the motor skills to perform it, the Listening as well as the Observing and Motor-mimesis steps would become redundant. Therefore, the condensed approach would be ideal, allowing quicker motor skill development. The condensed approach is shown in Figure 4.40.

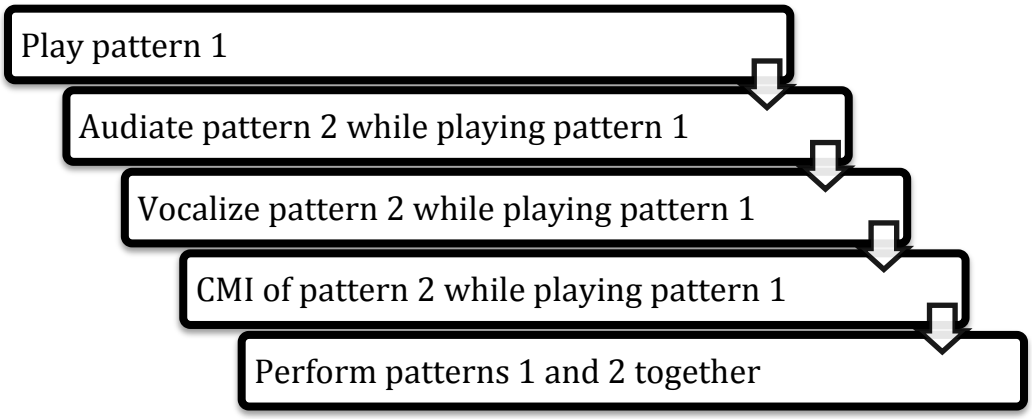


Figure 4.40. Condensed approach for pattern combinations.

This condensed approach can also be used to combine three and four patterns simultaneously. See figures 4.41 and 4.42.

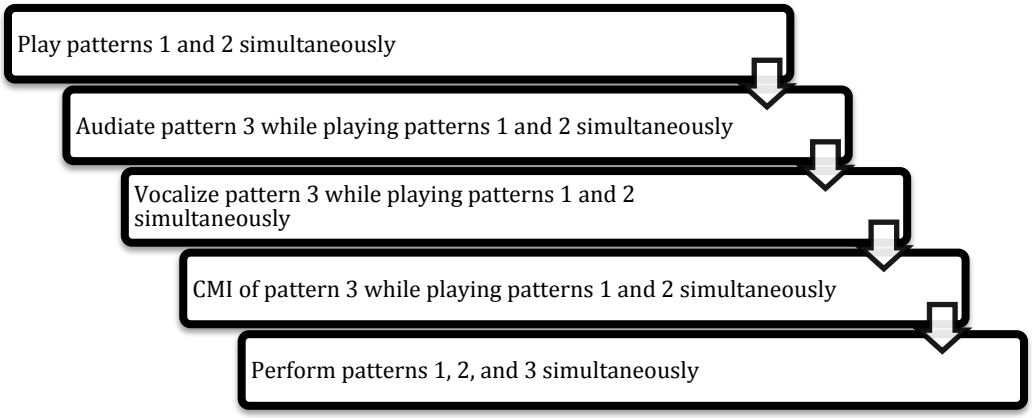


Figure 4.41. Condensed approach for 3 pattern combinations.

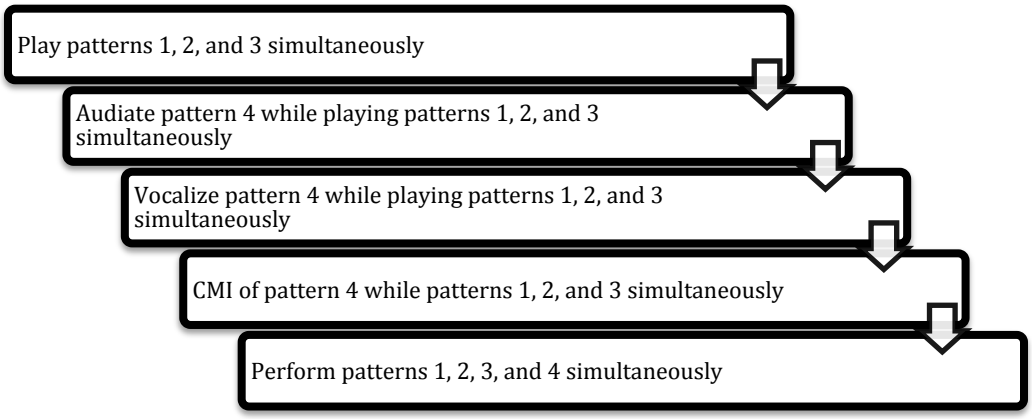


Figure 4.42. Condensed approach for 4 pattern combinations.

The condensed approach can also be used with other instruments that require pattern combinations. To have effective results, however, students must first develop the pattern vocabulary for the style they are studying. A general recommendation is to use the full approach to develop as many single patterns (basic vocabulary) as possible. Using the full approach, students should develop a minimum of four different grooves that combine two, three, or four patterns according to the instrument capabilities. Starting with the development of the 5th groove, students can start using the condensed approach because they should have a strong style background and sufficient vocabulary.

Melodic instruments. Melodic instruments will be treated differently than the instruments presented in the previous two categories. These instruments can have two different roles: playing the main melodic line or playing an accompaniment line. The main melody also needs to be performed with authenticity and with appropriate feel according to the style. Melodic instrument players will use the VLS steps (mainly the listening portion) to create a background in how the melodic lines are performed with proper inflection and proper feel according to the style they are learning. Melodies will likely have

inflections that resemble characteristic rhythmic patterns; however, students should not break it down into those possible patterns because it would disrupt the melodic discourse, leading to inauthentic performances. Students learn about rhythmic patterns and vocabulary during the VLS and that serves as the foundation to perform melodies with appropriate feel. Figure 4.43 shows an excerpt of *Tico tico no fubá*, a choro style song by Zequinha de Abreu e Eurico Barreiros.

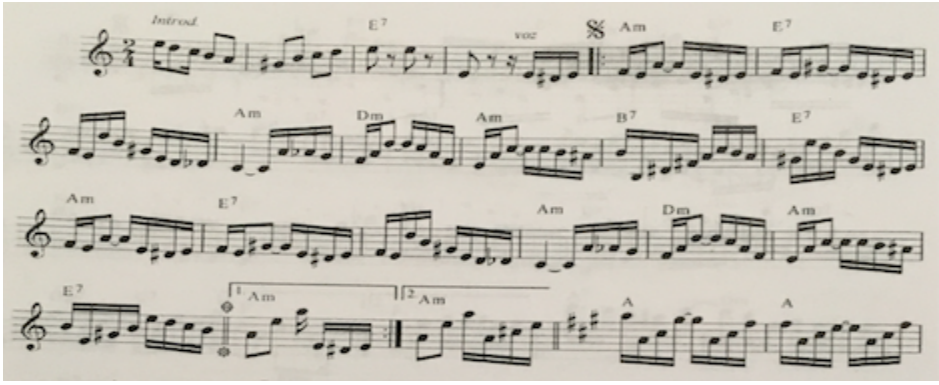


*Figure 4.43.*_Excerpt of Tico tico no fubá.

The four rhythmic patterns in Figure 4.44 are characteristic of the choro style. Note that the choro feel pattern shown is not an actual pattern but a reinforcement of the general stylistic feel that differentiates it from samba and bossa nova.

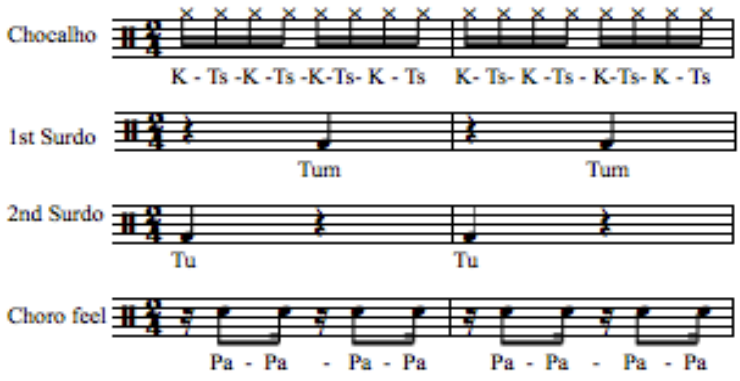


Figure 4.44. Main patterns of choro.

The main theme of the song starts on the pick up into measure five. If a student tries to fit this melody into any of the patterns by adding accents or trying to depict any sort of inflection related to one of the patterns in Figure 4.43, the whole melody would lose flow and coherence, and this process would not contribute to authenticity. For melodic lines, students need to audiate the patterns while playing, rather than imply the inflection of a specific pattern. By audiating several characteristic patterns – and developing CMI levels 3 and 4, for example – they will develop a sense of general feel. Therefore, listening to authentic recordings of choro in general and, of course, listening to this particular song will be a more effective way to approach and learn to perform it authentically.

Melodic instruments may also have accompaniment lines. Accompaniment lines can be divided in two categories: countermelodies that (like the main melody) resemble foundational rhythmic patterns, and rhythmic accompaniment lines that depict two or more patterns. The first should be treated and learned without being broken down in the same manner as the main melody. The second will have a different treatment to achieve proper motor skills and authenticity. In order to recognize the different types of accompaniment lines, melodic instrument players need to develop as much vocabulary as possible during the VLS. The more listening and exposure students are exposed to, the more rhythmic patterns they will learn. The more rhythmic patterns (vocabulary) they learn, the more adept they will be at recognizing whether or not an accompaniment line is a countermelody or a rhythmic accompaniment depicting two or more patterns. Distinguishing between these different functions is not an easy task; however, the key element to develop this skill is exposure and vocabulary development, crucial steps in the VLS.

After determining if the student is playing a main melody or one of the types of accompaniment lines, students will develop the required motor skills to perform them authentically. When developing motor skills to perform main melodic lines and accompaniment lines that are countermelodies, students will consider the psychomotor factors and practice different technical aspects separately. For example, a clarinet player would separate rhythm from pitches by practicing tonguing and breathing patterns alone and also the fingerings alone. Instructors should recommend that they listen to several recordings, analyze the melody, and mark the appropriate fingerings, breathing, and tonguing patterns in their scores. Once that is determined, each of those technical elements will be practiced separately and then recombined. For example, a clarinetist who is learning the melody of *Tico tico no fubá* would first analyze the melody and mark the two-beat main motive and its variations (see Figure 4.45).

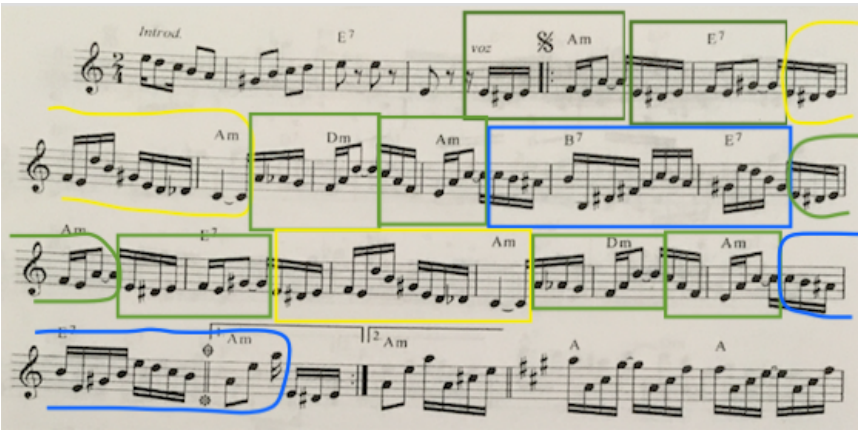


Figure 4.45. Tico tico no fubá excerpt with highlighted motives and variations.

After analyzing the entire piece, a clarinet instructor would evaluate the breathing and tonguing patterns and possible fingerings, and then determine which of the technical elements would be simpler and easier to be learned first. Once the instructor determines the best course of action, she will guide the student through each step to develop an

authentic performance for this melody. This process may vary depending on the assessment of the instructor and the technical requirements of the instrument that performs the melody. For example, on woodwind and brass instruments, breathing and tonguing will be involved along with fingerings. On bowed strings there will be different technical elements such as bowing. Whatever the case may be, instructors of the instrument will determine which technical elements should be learned first based on psychomotor factors. Each technical element of the instrument will have a different level of difficulty and the instructor should sequence them from the easiest to the hardest, adjust the motor development cycles to the specific situation, and use the combination cycles. For example, a violin student who is learning to perform the analyzed excerpt of *Tico tico no fubá* in Figure 4.44 would have his instructor determine whether the bowing or fingering should be learned first. After each element is learned in the appropriate sequence, the instructor will guide the student through the combining cycles to synthesize the required elements and achieve an authentic performance of the melodic line.

Another situation encountered by melodic instrument players is the rhythmic accompaniment lines composed to integrate two or more patterns. To develop motor skills to perform such lines, the student should first recognize the patterns based on the background developed during the VLS. After recognizing the patterns, the student will categorize the patterns based on metrical hierarchy, take into consideration psychomotor factors, and then practice each pattern separately before playing the accompaniment line in full. Figure 4.46 shows an example of a rhythmic accompaniment for baião style on clarinet.

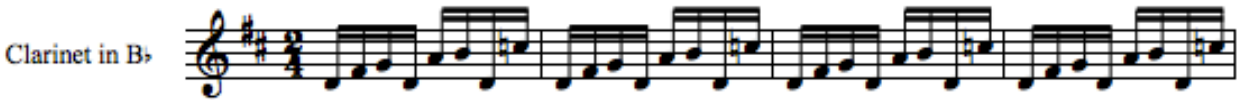
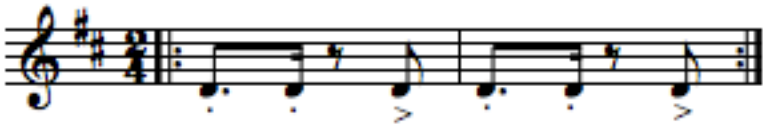


Figure 4.46: Clarinet accompaniment line for baião composed by two different patterns

This accompaniment line is based on a zabumba groove that can be broken down into two different patterns. The D pitches played on the clarinet are adapted from the low tone of the zabumba, while the other pitches are adapted from the high tone. Breaking down the groove into these two patterns would result in what is shown in Figure 4.47.

Pattern 1 (staccato and accents added to depict proper inflection)



Pattern 2

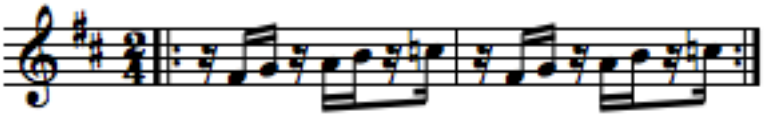


Figure 4.47: Clarinet accompaniment divided in 2 patterns

Recognizing such accompaniment lines and breaking them into separate patterns is not an easy task at first. Students will become more and more adept at recognizing these patterns through exposure and vocabulary development during the VLS. For this particular accompaniment, students would learn pattern 1 and then 2 using the cycle from Figure 4.37. The metrical hierarchy determines the sequence in which the patterns are practiced. Within each pattern, the clarinet instructor will determine which technical element is

approached first based on psychomotor factors. After those determinations, students will develop each technical element of Pattern 1 through the development cycles and then combine elements through the combination cycles. The same steps are applied to Pattern 2. Learning each pattern separately will allow students to understand the inflection of each pattern on their instrument and the general feel of the style. Based on the newly acquired knowledge and motor skills, the clarinet student will recombine the patterns into the full accompaniment line. In order to provide effective guidance, the instructor will first determine, based on the psychomotor factors, the sequence of the technical elements to be practiced for the full line (in case any change took place when breaking it down). Second, the instructor will encourage the student to practice each technical element of the full line separately using the development cycle. Lastly, students will combine all elements via the combination cycle, thereby developing an authentic performance of the rhythmic accompaniment line. It is important to again reinforce the foundational rule that a single pattern should not be broken under any circumstances. Patterns should always be learned in their entirety to maintain the rhythmic syntax and authenticity. Technical elements of any instrument can be divided and practiced separately; however, doing so should not disrupt the pattern. The authenticity of each single pattern is more important than any other element; compromising the wholeness of a pattern would compromise the authenticity of the performance developed during the VLS.

Each melodic instrument has different technical issues. A trombone or trumpet will not require the same consideration of psychomotor factors related to hemispherism since these instruments do not require the use of both hands to perform a melody. When these instruments have accompaniment lines depicting and combining patterns, the sequence of patterns will be defined by metrical hierarchy only. For bowed strings, psychomotor

factors will have more relevance since it is possible to practice fingering and bowing separately without breaking patterns apart; this would be a similar situation as seen with the guitar.

Practice Strategies

During motor skill development, instructors and students will create a specific sequence of patterns and a detailed approach to the cycles of motor skill development. As students go through the cycles, they will need to practice and solidify both the knowledge acquired during the VLS and the motor skills acquired during the first part of the MLS. The consistent application of research-based practice strategies will optimize the time spent on each task. Three main factors should be taken into consideration to structure the practice time: duration of practice sessions, the importance of accurate practice, and the contribution of sleep during the motor skill development process.

Duration of practice sessions. The length of practice sessions will have a great impact on the motor skill development. Whenever students start learning a new Brazilian popular music style, they will be required to develop a whole new set of motor skills, vocabulary, sense of context, and authenticity. Each style will be filled with basic rhythmic patterns and a series of variations that creates the style's vocabulary. Students can engage in massed practice – practicing for many consecutive hours – or plan for distributed practice, splitting the total time into smaller sessions spread throughout the day. Tan, Pfordrescher & Harré (2010) report that "studies show distributed practice to be more effective than massed for learning many types of motor skills" (p. 186) and the breaks resulting from distributed practice "give the students an opportunity to take a fresh look at the music, and to understand its structure more deeply" (p. 186). Therefore, students should opt for spreading several shorter practice sessions throughout the day rather than

engaging in one long session. “The ‘best’ violinists distributed their practice into three to four sessions per day that varied from approximately half an hour to about 2 hours per session, often playing for no more than about 50 minutes before taking the first break” (Tan, Pfordrescher & Harré, 2010, p. 186). By organizing three to four practice sessions per day, students will have better results during the motor skill development. I usually recommend to my students that they create four 90-minute sessions per day with 5-10 minute breaks after the first 50 minutes of each session. Of course, each student is unique, so students should be encouraged to experiment until they find the appropriate distribution of time that works best for them. Students should be encouraged to keep their sessions between 30 to 120 minutes and only take breaks if the entire session surpasses 50 minutes.

The importance of accurate practice. Accurate practice is extremely important for the development of any skill. Many structures of the brain are involved during music performance and practice. Besides influencing the determination of the sequence in which patterns will be practiced, the consideration of brain function will serve as another parameter to help students organize their practice sessions. For example, when using both hands, performers will be activating motor regions in both hemispheres of the brain, which communicate with each other via the corpus callosum. Moreover, when using all four limbs even more regions are activated since “regions of the motor cortex (posterior section of the frontal lobe) [have] a direct relationship to muscles in the body” (Tan, Pfordrescher & Harré, 2010, p. 60). Taking these facts into consideration will allow instructors and students to structure the practice sessions in the most effective and progressive way, optimizing the time spent on each task.

It is not a secret that motor skills improve with practice, but what is practice? Is it the simple act of repeating actions and movements? Practice is understood as "repetition of the procedure (1) with intent on the part of the learner to achieve an improved performance, and (2) with feedback, which provides information to the learner" (Gagné, 1985, p. 207). Regarding the intent to improve performance, students will apply the steps in the VLS-MLS cycles as the procedures to be repeated. By repeating each cycle, they will be solidifying not only motor skills but also the authenticity of each pattern learned and grooves resulting from combinations. The CMI step will provide clear objectives to be achieved during each practice session. Students will repeat the cycles until the CM-image is transferred from the virtual world (students' minds) to the physical world (performance). Receiving feedback will also be critical and it will be provided in multiple ways: from the instructor in each lesson, via sources of that allow comparisons with the students' performance such as listening guides and video samples, or by watching and observing more experienced players. Additionally, students can record themselves practicing, and later watch and evaluate their performances based on the knowledge acquired during the VLS. Moreover, they can compare their actual performances with the CM-image previously developed. Therefore, the development of these CM-images is also valuable for enabling thorough self-evaluations of their own performances.

While developing new motor skills, two structures of the brain become particularly important: the primary motor cortex and the cerebellum. When a person learns new motor skills, synapses in these two areas change. "The synapses that relay the information on how to play something correctly get strengthened, while those that send erroneous or irrelevant messages get weakened" (Gebrian, 2015, p. 29). Also, if the students are not well aware of what they are supposed to achieve during a practice session, their practice may

result in an undesirable strengthening of wrong messages and synapses. To fix the passage "one group of synapses would have to be strengthened while also weakening another, rather than simply strengthening the message" (Gebrian, 2015, p. 30). With the use of the practice cycles, students will come to fully understand every musical and motor aspect present in each single pattern as well as each groove resulting from the combination of patterns. With that in mind, the learning cycles should be used to develop each pattern and eventually the grooves resulting from different combinations. The development of different levels of CM-images result in an additive approach in terms of motor regions in the brain regardless of the instrument the student plays; therefore, when organizing the content that will be practiced in each session, students should start by practicing CM-images Level 1 and, as they achieve the desired results, they can move up to Level 2, then 3, and lastly 4.

The role of sleep. According to research, sleep plays a very important role in the consolidation of motor skills. During practice sessions, performers are strengthening and weakening synapses in their brains. As Gebrian (2015) reports, this is true during sleep, as well:

> During a sleep spindle, there is a huge burst of electrical activity in a population of neurons that causes massive amounts of calcium to enter those cells. Calcium is what causes all the changes discussed earlier, from strengthening and weakening synapses, to making new synapses, to synchronizing the firing of neuronal ensembles. (p. 31)

A series of studies by Walker et al. in 2002, 2003, and 2005 (as cited in Gebrian, 2015) provides an example of the unique and perhaps surprising impact of sleep on the consolidation of basic motor skills:

> Their basic experimental setup involves three groups of people. The first group gets taught a finger-tapping task at 10 AM, which they then practice and are tested on multiple times throughout the day. The second group gets taught and practices the same task at 10 AM, but they don't get tested on it again until 10 PM. Then, they are sent home to sleep and tested the next morning at 10 AM. The final group is trained on the task once (either at 10 AM or 10 PM; the timing does not matter) and has their first and only retest at 10 AM the next morning.
>
> What they found is astonishing. The first group improves gradually throughout the day at a predictable linear rate. The second group shows the same linear increase during the day, but when tested the next morning, there is a huge jump in their performance (measured by faster sequence execution without loss of accuracy). The same result is seen in the group that was only trained once and then was retested for the first time the next day. Both groups get better overnight, even though all they do is sleep. (p. 30)

Tan, Pfordrescher, and Harré (2010) also report that "It appears that the memory trace for motor learning continues to be reprocessed even during periods without intervening training, and that sleep plays a critical role" (p. 186). Additionally, research supports the importance of napping during the development of motor skills. According to Ericsson, Krampe, and Tesch-Römer, 1993 (cited in Tan, Pfordrescher, & Harré, 2010), results from the comparison of three groups of violinists showed that "the top two groups of violinists also napped more often than the less accomplished third group" (p. 186). Therefore, napping also helps optimize the time spent on the development of motor skills. In combination with distributed practice, sleeping can contribute to a faster and more

effective development of motor skills. Both napping between practice sessions and getting a good night's sleep will enhance the development and consolidation of motor skills.

Summary of practice strategies. Based on these three guidelines – duration of practice sessions, accurate practice, and sleep – instructors and students will create specific objectives to be achieved during each single practice session as well as create a schedule allowing the student to spread several practice sessions throughout the day. For example, a percussion student learning baião style would need to learn a series of patterns to be performed on different instruments such as the zabumba, triangle, woodblock, agogo bells, and drum set. After completing the VLS steps to become familiar with the basics of the style and developing CM-images, the student would start practicing and developing physical motor skills. Based on the research about distributed practice being more effective for the development of many types of motor skills and the role of breaks during the practice sessions, I would recommend four practice sessions per day lasting a minimum of 90 minutes per session. During each session the student should have a clear objective to achieve during that time and should take a 5-10 minute break after 50 minutes. The length of each practice session and the breaks may vary depending on the student's schedule.

It is well known that motor skills improve with practice; therefore, the more the students practice effectively, the more they will improve. With that in mind, a student learning baião style would learn to play the zabumba. She would start by practicing several Level 1 CM-images to develop the basic vocabulary. Figure 4.48 shows a series of patterns for the low tone of the zabumba.

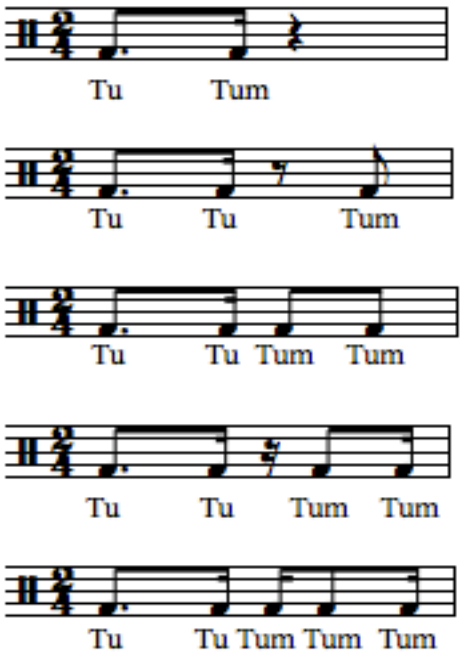


Figure 4.48: Zabumba low tone patterns.

Each pattern would be developed through the cycle in Figure 4.37. In a 90-minute session, the objective would be to develop all five patterns. By spreading four practice sessions with the same objective throughout a single day, however, students are likely to achieve this objective fairly quickly. Because the motor skills are being consistently reinforced, continued growth will become easier and less time-consuming as the process is repeated. An additional recommendation is to work on all five patterns using the cycle during the first 50 minutes of the session – in this case, 10 minutes of practice per pattern. After taking a short break, play the patterns along with songs from the listening guide. This play-along portion will help solidify not only the motor skill but also the authenticity of the patterns in context. Again, each student will progress at a different rate and it will be up to the student and the instructor to evaluate the progress, communicate, and make adjustments in length and objectives for each practice session. In addition to defining clear objectives and

spreading the session throughout the day, students can take naps between sessions and/or have a practice session at night before going to sleep.

Conclusion

The MLS is designed to create strategies that gradually develop motor skills. By organizing the rhythmic patterns of each style according to the metrical hierarchy and psychomotor factors, students and instructors will be able to create an effective sequence for motor skill development. Moreover, by considering the motor skill requirements of each instrument, defining clear objectives for the practice sessions, and spreading several practice sessions throughout the day, students become able not only to develop motor skills to perform Brazilian popular music styles but also to reinforce and solidify the knowledge and authenticity acquired during the VLS. The development of each new pattern and groove will use cycles that interweave both Virtual and Motor learning sequences. Through these cycles, students will develop a sense of contextualization of the patterns within each style studied, clear imageries of how to play the patterns and the grooves resulting from the combinations, strong motor skills, and overall authenticity. Through this pedagogical approach, non-native Brazilian students can develop authentic performances of Brazilian popular music styles with high levels of motor skills, becoming well-rounded, independent musicians who are able to plan and modify their own practice strategies as well as monitor and improve the level of their own performance. By acquiring these skills, students will be able to compare different performances and evaluate the level of authenticity and motor skills of other players and assess whether or not such performances are authentic, representative of a determined style, and reliable sources for future studies.

CHAPTER 5
SUMMARY AND RECOMMENDATIONS

Brazilian popular music styles are notably growing in popularity around the world and, although many of these styles are being widely taught outside Brazil, non-native Brazilian musicians often struggle to learn and perform them in an authentic manner. Despite the wide variety of resources and method books available, the cultural context and the subtleties of styles are either unknown, ignored, or not approached with enough depth for non-natives. Therefore, non-native musicians are not developing the necessary understanding about how the salient patterns and musical elements synthesize to become a style. The purpose of this project was to develop and present a pedagogical approach to teaching the authentic performance of Brazilian popular music styles to non-native musicians, teaching them cultural background and context as well as pattern vocabulary and technical skills via the interweaving of two learning sequences. This two-stage, research-based approach was designed based on the foundations of music perception, music cognition, and psychomotor learning theories to develop both authenticity and motor skills. The Virtual Learning Sequence (VLS) serves as stage 1 and is primarily designed to develop authenticity. Through listening, audiating, and vocalizing, students develop the vocabulary of each style. Next, through observing, motor-mimesis, cognitive motor-imaging, and mental practice, they create cognitive associations between the vocabulary and the motor skills required to perform it. In stage 2, the Motor Learning Sequence (MLS) guides musicians to create and apply a gradual sequence to develop the physical motor skills necessary to achieve an authentic performance. Additionally, the MLS

provides practice strategies for approaching motor skills development objectively and with clear goals.

Initial Effectiveness and Other Applications of the Approach

Each Brazilian popular music style represents the culture of its region or community. A great variety of styles exist that are unknown to the major population of the country itself and, of course, to the world. Although this pedagogical approach focuses on teaching samba, bossa nova, choro, baião, and maracatu to non-native Brazilians, I also experimented using the approach with native Brazilians. While developing this pedagogical approach over the past two years, I used its elements in a variety of educational settings. As a percussion and drum set instructor, I started this project to teach students of those instruments. At the same time I was also directing Brazilian popular music ensembles, and I started expanding the approach to other instrumentalists in that setting. While directing student ensembles at Ball State University and Indiana Wesleyan University, I was focusing on research, the creation of this pedagogy, and then experimentation with several of its steps. Although the vocalization portion was not yet finalized and the CMI did not exist at that point, I was still able to apply a similar teaching approach, make recordings at the end of the semester, and obtain anecdotal evidence of its effectiveness in terms of authenticity.

In a brief questionnaire sent to a few Brazilian popular music experts, the sample recordings of ensembles prepared using the pedagogical approach were interposed with recordings of native ensembles and non-native ensembles that were not exposed to this approach. The respondents were asked to rate the technical skills and perceived authenticity of the various performances. Of most significance to this project, the questionnaire presented the statement, “The level of authenticity is very high,” and solicited responses on a Likert-type scale from “Strongly Disagree” to “Strongly Agree.” In

retrospect, it probably would have been better to ask the respondents to rate the level of authenticity from "Not at all Authentic" to "Very Authentic," for example, to obtain results that resulted in more explicit interpretation. Nevertheless, the data suggests that the focus item was discriminating given that the four expert respondents collectively identified the recordings of the two native ensembles as the most authentic based on Authenticity scores calculated by assigning points to SD, D, U, A, and SA (1, 2, 3, 4, and 5, respectively). The two native performances earned scores of 18 and 16. The lowest Authenticity score (10) was earned by the recording of a non-native but professional ensemble. Most significant to this project, the recordings of the three student ensembles prepared using the pedagogical approach all earned Authenticity scores the same as or higher than the non-native professional ensemble (13, 12, and 10), with the student ensemble that was prepared using the pedagogical approach most consistently and thoroughly receiving the highest of these scores. The only non-native ensemble to earn a higher Authenticity score (15) was the well-known and professional Stan Getz band. So, even with the qualifier of "very high" in the target statement, the student ensembles prepared using the pedagogical approach were perceived as relatively authentic as compared to professional non-native ensembles. This appears to provide some initial validation of the approach, albeit based on a very limited sample (see Appendix D for a summary of the survey questionnaire data).

While experimenting with several steps of both learning sequences in a variety of situations, I came to realize that, in a very broad view, most music styles could be structured similarly and approached as a language that includes a wide vocabulary of musical patterns. Certainly, some styles are much more complex than others, but it is possible to determine the main characterizing patterns within each different style. Based on this premise, I experimented with the steps of the VLS to develop authenticity when

teaching Funk, Rock, Jazz, and Latin styles. I also experimented with classical repertoire on a variety of percussion instruments like marimba, vibraphone, timpani, and snare drum. In orchestral music, I used the listening portion to familiarize students with the actual excerpts they were playing, encouraging them to audiate not only their parts but also the entire orchestration to help contextualize their parts.

After finalizing the pedagogical approach and using it in a more complete way, the vocalization step became one of its most important elements. When teaching drum set, I ask students to vocalize onomatopoeic syllables that depict the sound of the drums. After effectively vocalizing the part, they are often able to perform it in their first attempt. Minor technical issues occur, of course, and I encourage them to use motor-mimesis, CMI, and slower tempi, as well as the combination cycles from the MLS when appropriate. The vocalization step is extremely effective, and the entire VLS facilitates the development of general understanding about the style. Although the steps in this pedagogical approach appear to be an effective and efficient strategy for developing understanding and initial motor skill development, the students must apply the practice strategies and spend many hours perfecting their skills to become proficient musicians.

Recommendations for Further Research

As I was developing this pedagogical approach and experimenting with its application to several different music styles, I made my own observations about its effectiveness and solicited some initial insights from a few Brazilian popular music experts. More substantial indicators of its effectiveness could be obtained through experimental or quasi-experimental studies with larger populations. Such studies would provide valid and reliable results without any biases rather than the anecdotal results obtained by gathering data from a brief and limited survey based on audio samples recorded prior to the full

development of the pedagogical approach. Further research would provide more detailed information about its benefits.

Further research can also focus on how this pedagogical approach could work when applied to different cultural music styles. Although this project was originally developed to teach authenticity and motor skills of Brazilian popular music styles, it is grounded in the applications of music perception, music cognition, and psychomotor learning theories. Therefore, music teachers specializing in different styles of cultural music could study it, make adaptations, and apply the steps of the two learning sequences in different contexts. For example, this pedagogical approach could potentially be used to teach West African traditional folk music such as Yoruba and Ewe, which like Brazilian styles are rooted in salient rhythmic patterns and percussion instruments. Additionally, it could be applied to a variety of South American styles such as cumbia from Colombia, joropo from Venezuela, and tango from Argentina. Whatever the instructor's expertise, the entire sequence or specific elements of the approach could be used and adapted to each situation. The instructor would create a list of musical patterns to build the vocabulary of the style and also a listening guide for the listening portion, helping students develop authenticity.

Finally, research could reveal more information about the effectiveness of the proposed practice strategies and the resulting benefits for different motor skill development. Based on my personal experience as a musician, I was able to develop my performance skills more efficiently and consistently once I started applying these strategies to my own practice. The fact that I spent most of my life working on those skills cannot be ignored, however, since this provided a strong background prior to using these strategies. A formal research study could be designed to investigate the effectiveness of the approach

with music students of varying backgrounds and different levels of motor skill development.

Conclusion

Given the vast world of different musical cultures, performing and teaching music different from one's own culture with authenticity is one of the most challenging tasks for a musician. As both artist and pedagogue, I teach music to non-native Brazilians and seek to transmit to my students and colleagues even the smallest cultural details that make each style unique. The desire to share my skills and knowledge about Brazilian music with my students, fellow performers, and other teachers motivated me to explore music psychology research to find the necessary resources and help others perform such styles with the highest level of authenticity.

The ability of music teachers to transfer the knowledge of each culture's music is not only an effort to improve students' musical knowledge and skills but also a display of respect for a particular culture and its people. As a result of my endeavors as a touring performer, arranger, composer, and ensemble director, I experienced what I consider the proverbial "tip of the iceberg" of many cultures. I have been blessed to meet people from all of North and South America as well as Africa, the Middle East, and Asian countries, and to exchange with them musical and cultural knowledge. The difficulties of understanding and learning about so many different cultures and their music were also motivating factors that led me to pursue this project. Not only am I attempting to transmit and help others learn about Brazilian popular music styles, but also to help other musicians become adept at teaching the authentic performance of their own musical culture or any music they specialize in. I am hoping that, through music, we can learn about, understand, and respect the different cultural backgrounds of people around the world.

REFERENCES

Adams, M. C. (2014). *Student and teacher experiences with informal learning in a school music classroom: An action research study* (Master's thesis). Retrieved from The University of Nebraska-Lincoln.

Aquino, T. F. (2014). *Drumset, rhythm, samba* (Doctoral dissertation). Retrieved from São Paulo University.

Bandura, A. (1970). *Social learning theory*. Englewood Cliffs, NJ. Prentice-Hall.

Barsalini, L. (2009). *As Síntesis de Edison Machado: Um estudo sobre o desenvolvimento de padrões de samba na bateria* [The Synthesis of Edison Machado: A study about the development of samba patterns on the drum set]. Retrieved from Unicamp.

Bolão, O. (2010). *Batuque é um privilégio: A percussão na músicado Rio de Janeiro para músicos, arranjadores e compositores* [Batuque is a privilege: Percussion in the music of Rio de Janeiro for musicians, arrangers and composers]. São Paulo, SP. Irmãos Vitale S/A Indústria e Comércio.

Brunet, C. S. (2012). *Carnaval, samba schools and the negotiation of gendered identities in São Paulo, Brazil* (Doctoral dissertation). Retrieved from University of California, Berkeley.

Criss, E. (2008). The natural learning process. *Music Educators Journal, Vol. 95(2), 42-44.* doi:10.1177/0027432108325071

Ester, D. (2010). *Sound connections*: *A comprehensive approach to teaching music literacy. Fishers, IN: Educational Exclusives.*

Gebrian, M. (2015). Brain research and practicing. *Flute Talk Magazine. Vol. 35(2) 29-33.*

Gonçalves, G.,Costa, M. O. (2012). *O batuque carioca – 2a edição: As baterias das escolas de samba do Rio de Janeiro - Aprendendo a tocar* [The Carioca groove – 2nd edition: The Rio de Janeiro's samba schools drum sections – learning to play]. Rio de Janeiro, RJ. Groove produções e edições.

Godøy, R. I. (2003). Motor-mimetic music cognition. *Leonardo*, *Vol. 36(4), pp. 317-319.* doi:10.1162/002409403322258781

Gomes, Sergio. (2004). *Novos caminhos da bateria brasileira* [New ways of Brazilian drumming]. São Paulo, SP. Sérgio Gomes.

Gordon, E. (2012). *Learning sequences in music,* Chicago, IL. GIA Publications Inc.

Gagné, R. M. (1985). *The conditions of learning and theory of instruction.* New York, NY. Holt, Rinehart and Winston, Inc.

Knapp, D.H. (2012). *The effects of multicultural music instruction on the perception of authenticity and preference for teaching multicultural music* (doctoral dissertation). Retrieved from Florida State University.

Kohut, D. L. (1985). *Musical performance: Learning theory and pedagogy.* Englewood Cliffs, NJ. Prentice-Hall.

Lopes, R. (2013). *O Ensino da "guitarra brasileira": Uma construção* [The teaching of "Brazilian guitar": A construction]. (Master's thesis). Retrieved from UFRJ.

Luckner, J. L. (1990). Information processing: Implications for educators. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, Vol. 64(2), 99-102.* doi:10.1080/00098655.1990.9955819

Monteiro, D. (2015). *The samba school: A comprehensive method for learning, playing, and teaching samba percussion.* São Paulo, SP. Contemporânea.

Murray, E. A. (2013). *Tradition and innovation in the pedagogy of Brazilian instrumental choro.* (Doctoral dissertation). Retrieved form Kent State University.

Raphael, A. (1990). From popular culture to microenterprise: The history of Brazilian samba schools, *Latin American Music Review/Revista de Música Latino-americana, Vol. 11(1) 1,* 73-83. doi:10.2307/780359.

Ramalho, E. R. (1998). *Luiz Gonzaga: His career and his music.* (Doctoral dissertation). Retrieved from University of Liverpool

Reily, A. S. (2000). Introduction: Brazilian musics, Brazilian identities. *British Journal of Ethnomusicology, Vol. 9(1)*, 1-10. doi:10.1080/09681220008567289.

Smith, A. (2014). *O Baterista – Contemporary Brazilian drum-set: Afro-Brazilian roots & current trends in contemporary samba-jazz performance practice.* (Doctoral dissertation). Retrieved from Indiana University.

Swanson, B. L. (2004). *Marco Pereira: Brazilian guitar virtuoso.* (Master's thesis). Retrieved from University of Florida.

Tan, Siu-Lan, Pfordrescher, Peter. Harré, Rom. (2010). *Psychology of music: From sound to significance.* New York, NY, Psychology Press.

Vygotsky, L.S. (1978) *Mind in society: The development of higher psychological processes.* M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (eds.). Cambridge, MA: MIT Press.

Willey, R., Cardim, A. (2010). *Brazilian piano – Choro, samba, and sossa nova.* Milwaukee, WI. Hal Leonard Corporation.

Witelson S. F. (1985) The brain connection: The corpus callosum is larger in left-handers. *Science 229 (4714), 665-668*. doi:10.1126/science.4023705

Witmer, R. M. (2009). *Popular virtuosity: The role of flute and flutists in Brazilian choro.* (Master's thesis). Retrieved from University of Florida.

APPENDIX A

LISTENING GUIDE

Samba

- Album – Sambas de Enredo das Escolas de Samba 2017
    - Só com a ajuda do santo (radio edit)
    - A divina comédia do carnival (radio edit)
    - Iracema, a virgem dos lábios de mel (radio edit)
    - O som da cor (radio edit)
- Album – Chico 50 anos - O Malandro by Chico Buarque
    - Quem te viu, quem te vê
    - Homenagem ao malandro
    - Doze anos
    - Quando o carnaval chegar
- Album – Braseiro by Roberta sá
    - Eu sambo mesmo
    - No braseiro
    - A vizinha do lado
    - Cicatrizez
- Album – Num corpo só by Maria Rita
    - O homem falou
    - Cria
    - Trajetória
    - Corpitcho

Bossa Nova

- Album – Elis & Tom by Tom Jobim and Elis Regina
    - Aguás de marco
    - Corcovado
    - Triste
    - Por toda minha vida
- Album – Tom Jobim canta Vinícius by Tom Jobim
    - Insenatez
    - Eu não existo sem voçê
    - Eu sei que vou te amar
    - Garota de Ipanema
- Album – Sambalanço by Carlos Lyra
    - Lobo bobo/Saudade fez um samba/Se étarde me perdoa
    - Minha namorada
    - Você e eu/Coisa mais linda
    - Pode ir
- Album – Chega de saudade by João Gilberto
    - Chega de saudade
    - Saudade fez um samba
    - Desafinado
    - Manhã de carnaval

Choro

- Album – Para sempre by Pixinguinha
    - 1 X 0
    - Urubatan
    - Fala baixinho
    - Elizete no chorinho
- Album – Cartola (1976) by Cartola
    - Não posso viver sem voçê
    - Aconteceu
    - As rosas não falam
    - Meu drama (senhora tentação)
- Album – Mandolin master of brazil original classic recordings vol. 1 by Jacob do Bandolin
    - Assanhado
    - André de sapato novo
    - Naquele tempo
    - Benzinho
- Album – Benedito Lacerda e Pixinguinha by Benedito Lacerda e Pixinguinha
    - Atraente
    - SAinda me recordo
    - Vou vivendo
    - Sofres por que queres

Baião

- Album – Sem limite - CD 1 and CD 2 by Dominguinhos
    - Doidinho, doidinho
    - Eu só quero um xodó
    - Asa branca
    - Não prende minhas asas
- Album – Volta pra curtir by Luiz Gonzaga
    - Hora do adeus
    - Pau de arara
    - Derramaro o gai
    - A feira de Caruaru

- Album – 50 anos de sucessos no forró by Trio nordestino
    - Chorando por alguém
    - Forró pagão
    - Morrendo de amor
    - Saudade da bahia
- Album – Cada um belisca um pouco by Dominguinhos, Sivuca & Oswaldinho
    - Feira de mangaio
    - Baião
    - Cada um belisca um pouco
    - Roseira do norte

Maracatu

There are not many published recordings of maracatu, although representative material can be found in the links below.

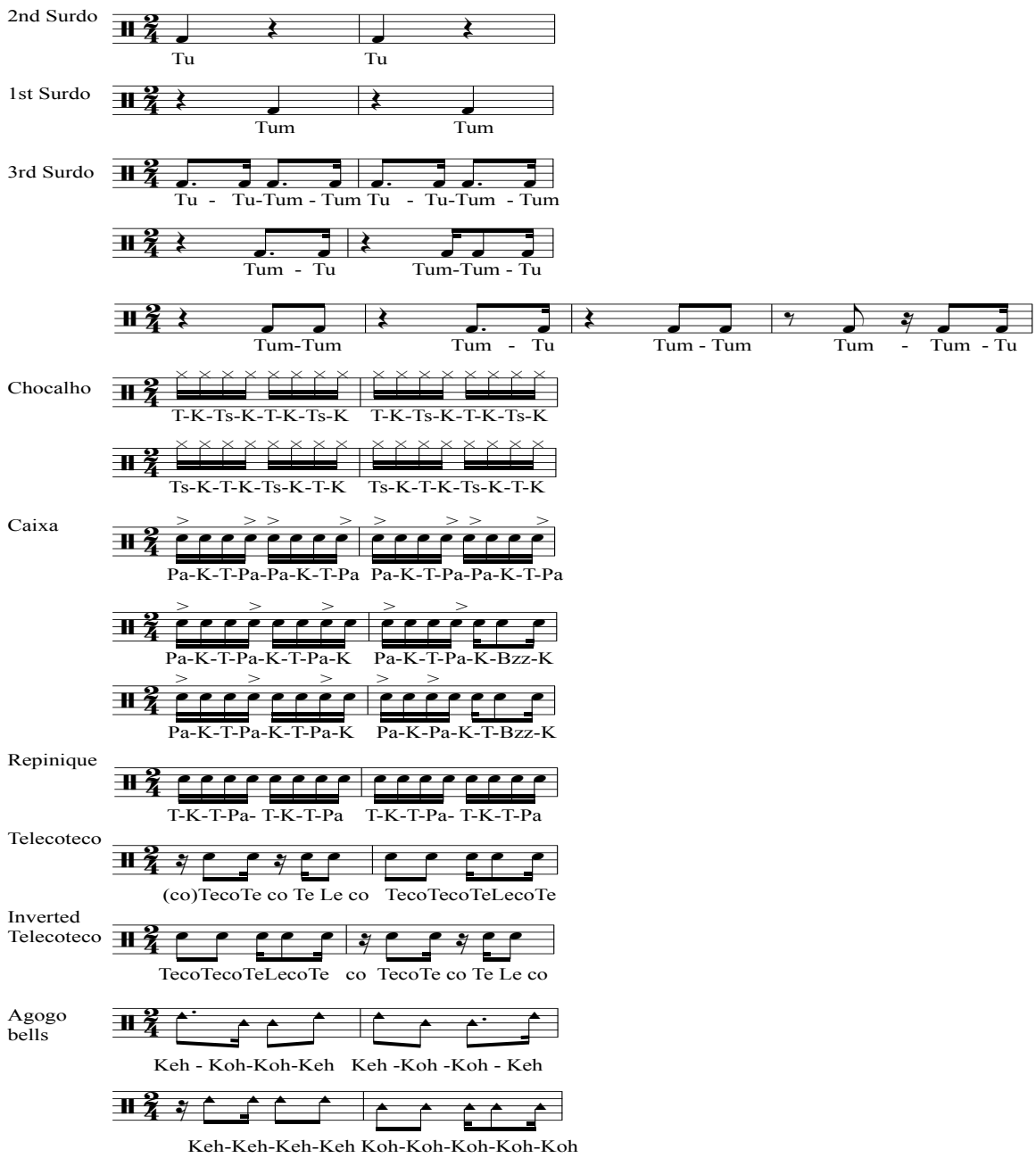
- Album – Maracatu Estrela Brilhante do Recife by Nação Estrela Brilhante (can be found on Youtube: https://www.youtube.com/watch?v=rGA4rKh7Ixo&t=63s accessed 10/15/2017).
- Maracatu mar aberto – (can be found on Youtube: https://www.youtube.com/watch?v=DqZX8m2T-e0 accessed 10/15/2017).

APPENDIX B

BASIC VOCABULARY

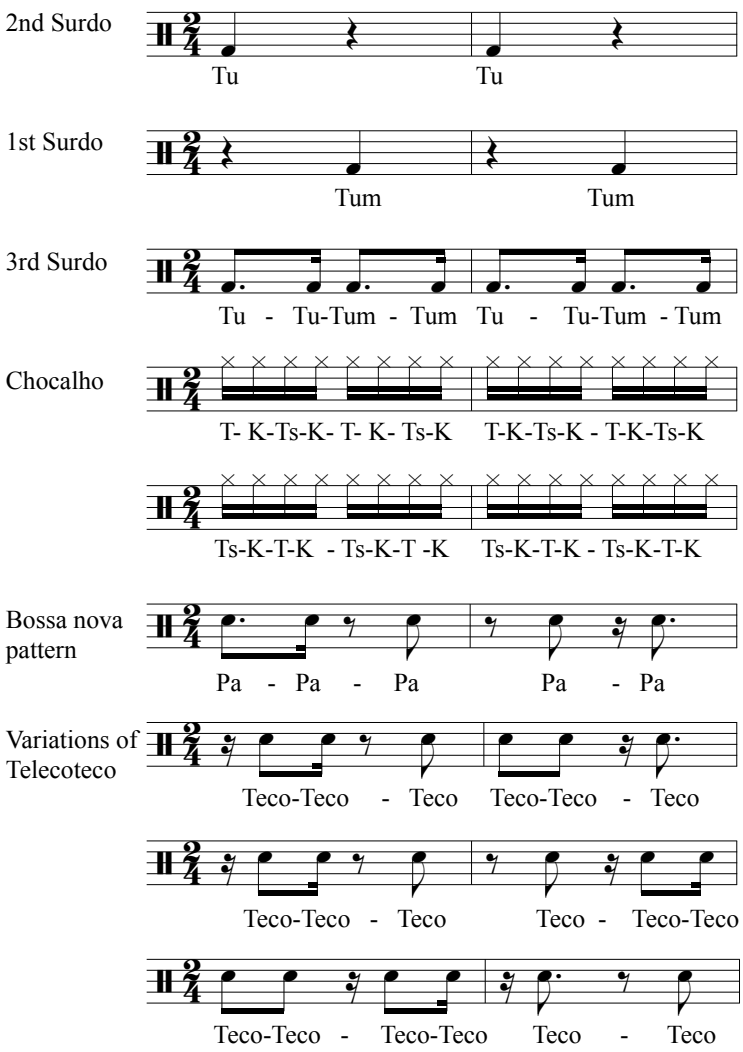
Samba basic vocabulary - listen to audio examples 62 to 76 at

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples



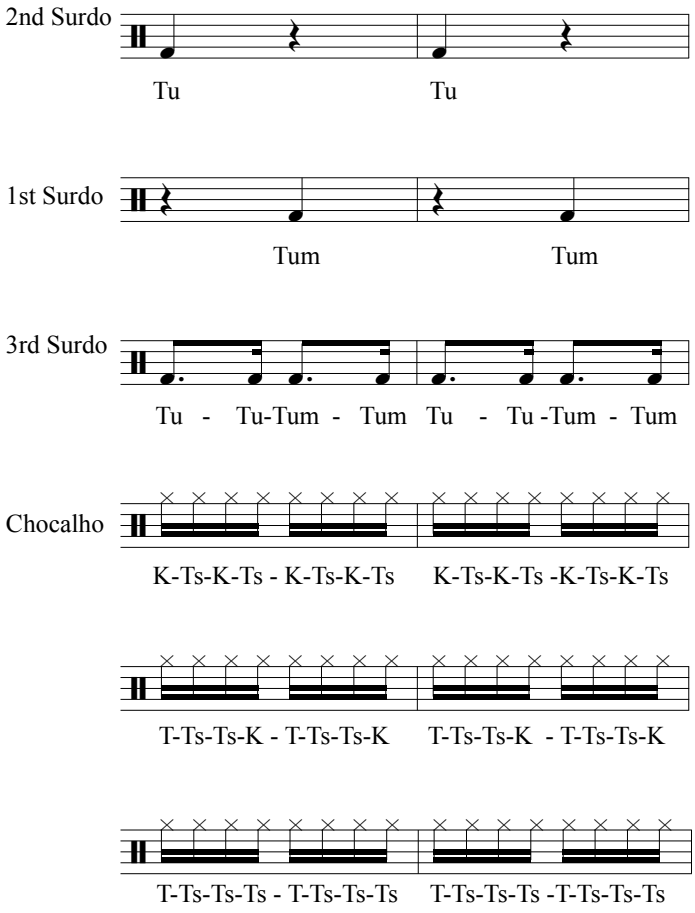
Bossa nova basic vocabulary - listen to audio examples 77 to 85 at

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples



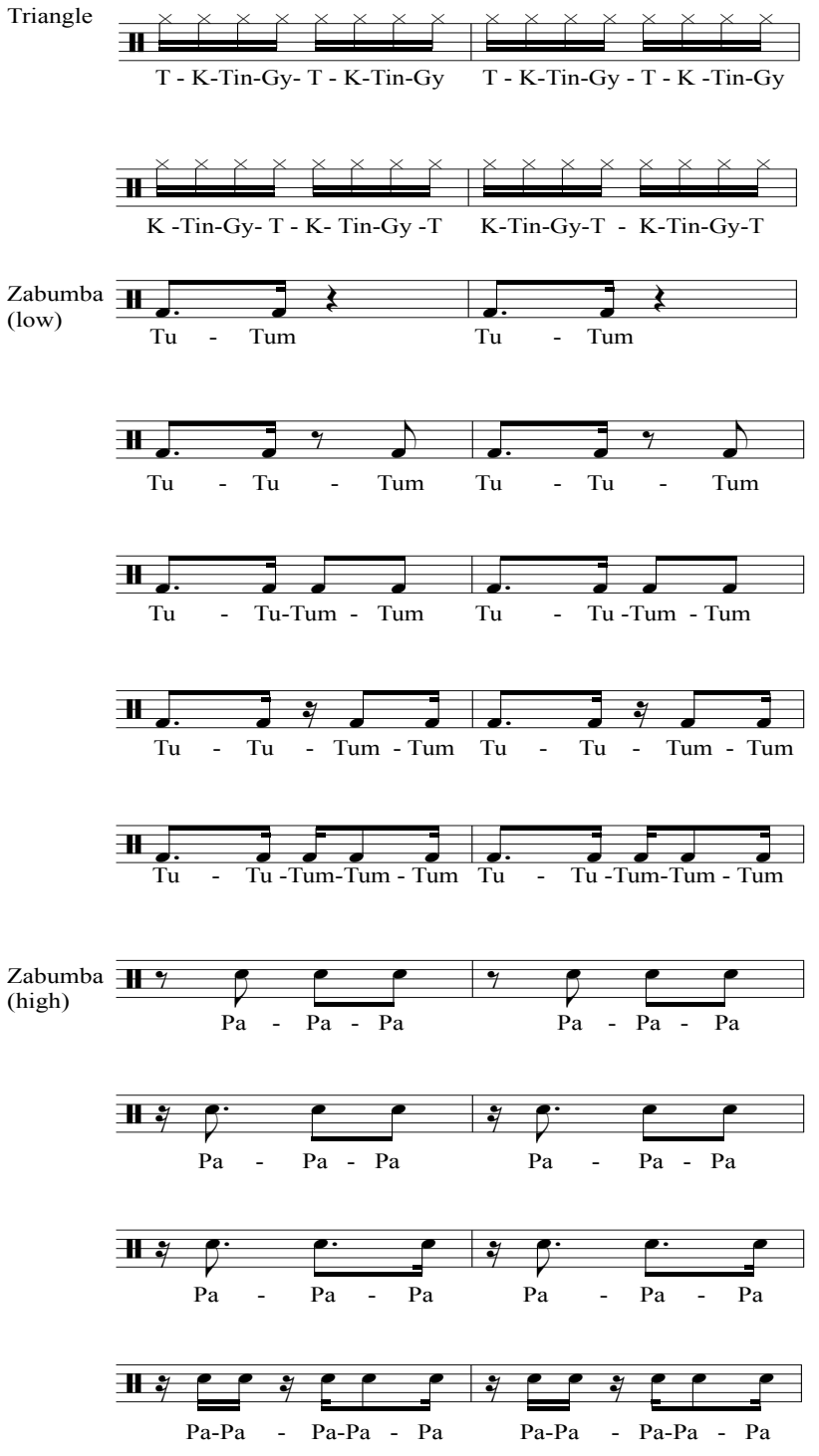
Choro basic vocabulary - listen to audio 86 to 91 at

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples



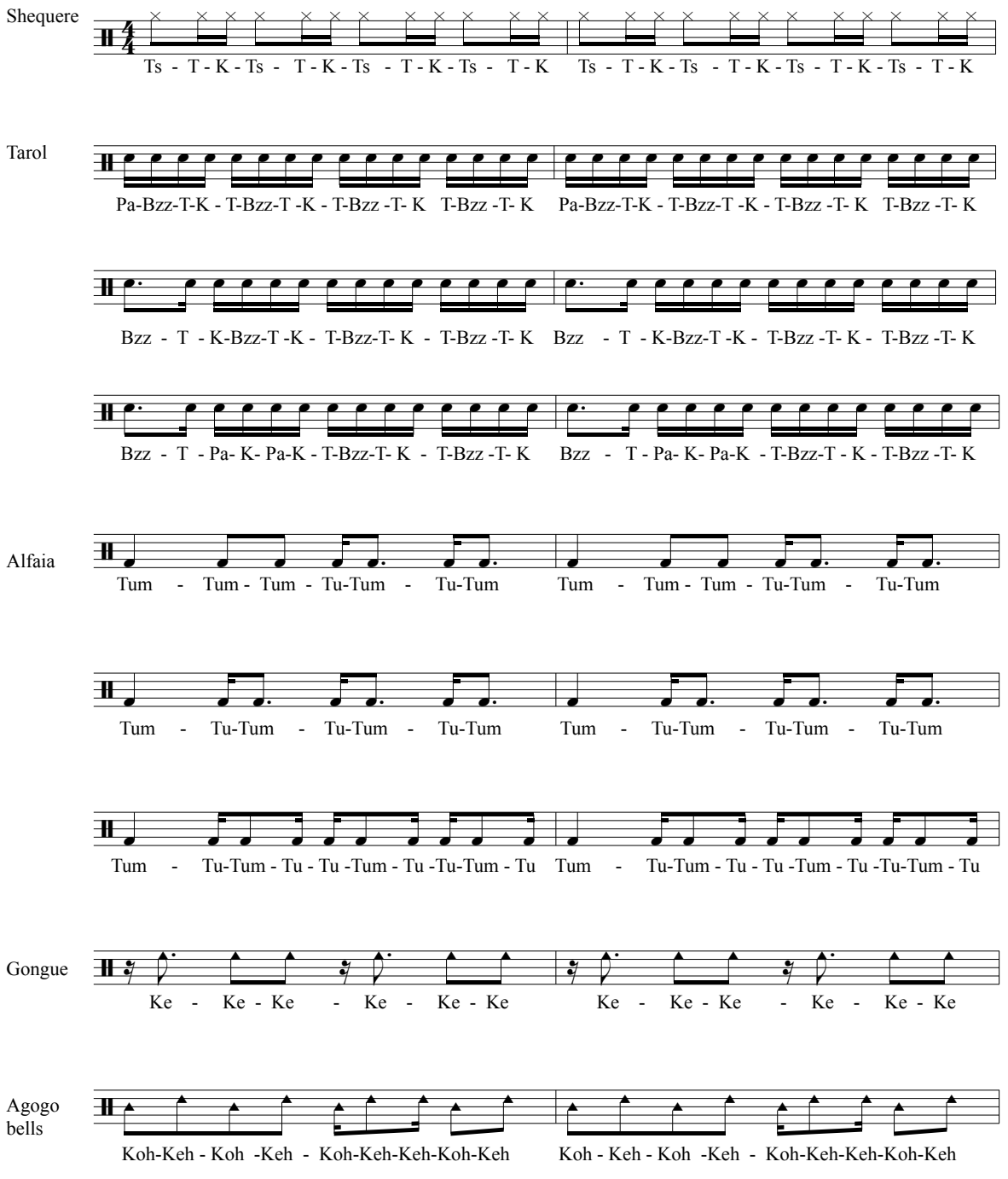
Baião basic vocabulary - listen to audio examples 92 to 102 at

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples



Maracatu basic vocabulary - listen to audio examples 103 to 111 at

https://soundcloud.com/bruno-cabrera-40190673/sets/doctoral-dissertation-audio-examples



APPENDIX C

QUESTIONNAIRE

Sample recording 1: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 2: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 3: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 4: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 5: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 6: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

Sample recording 7: Mark your answers with an X.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 - The technical skills are very high.					
2 - The level of authenticity is very high					
3 - This ensemble is native Brazilian					

APPENDIX D

SUMMARY OF QUESTIONNAIRE DATA

	Prepared Using Pedagogical Approach	The technical skills are very high.					The level of authenticity is very high					This ensemble is native Brazilian					
		SD	D	U	A	SA	SD	D	U	A	SA	SD	D	U	A	SA	Total Authenticity
Non-native Professional Ensemble #1	No	-	1	-	3	-	1	1	1	1	-	-	2	2	-	-	10
Non-native Collegiate Percussion Ensemble #1	Yes	-	2	1	1	-	-	2	2	-	-	-	4	-	-	-	10
Non-native Collegiate Percussion Ensemble #2	Yes	-	1	-	2	1	-	1	1	2	-	-	1	2	1	-	13
Native Professional Ensemble #1	No	-	-	-	3	1	-	-	1	2	1	-	-	-	3	1	16
Non-native Professional Ensemble #2	No	-	1	-	1	2	-	1	-	2	1	1	1	-	1	1	15
Native Professional Ensemble #2	No	-	-	-	2	2	-	-	-	2	2	-	-	-	2	2	18
Non-native Collegiate Instrumental Ensemble	Yes	-	1	2	-	1	-	1	2	1	-	-	3	1	-	-	12